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THOMAS C. DESMOND
SENATOR 27TH DISTRICT

THE NUTRITION FRONT *

REPORT
OF THE
New York State
JOINT LEGISLATIVE COMMITTEE
ON NUTRITION
Legislative Document No. 64
1943

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THE NUTRITION ★ FRONT ★

REPORT
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NEW YORK STATE
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Letter of Transmittal

NEW YORK STATE JOINT LEGISLATIVE COMMITTEE ON NUTRITION

ROOM 430

THE STATE CAPITOL

ALBANY, NEW YORK

To the Governor and Legislature of the State of New York:

Concerned that unknown thousands of our people suffer from "hidden hunger," perturbed that one-third of the draftees found unfit for service during 1941 were rejected directly or indirectly because of nutritional deficiencies, and aroused by the fact that the production of war materials could, according to nutritionists, "be stepped up 10 per cent by proper eating," the 1942 Senate and Assembly by joint resolution created the New York State Joint Legislative Committee on Nutrition. The Committee was authorized to "proceed with a study and investigation of the proper role the state should play in relationship to nutrition."¹

ACTIVITIES

The Committee decided to concentrate its attention on the problems of nutrition in industry. While consideration has been given to other nutritional problems, chief emphasis of the Committee has been on industrial nutrition.

The Committee on December 16, 1942, held a public hearing in New York City at which leading nutritionists, scientists and public officials from many sections of the country gave us their advice and judgment. In addition, the research staff of the Committee compiled a large amount of pertinent data and made field trips to secure first-hand information from industrialists, labor leaders, and nutrition experts. Many widely known nutritionists and food experts contributed valuable reports. Our Committee staff analyzed the activities of various state departments concerned with nutrition, consulted federal nutrition authorities, and surveyed the nutritional activities of the cities of New York State.

¹ See Appendix A for resolution creating the committee.

An Advisory Council on Nutrition in Industry was appointed by our Committee. The Council consisted of the following:

Miss Elsie Bond, Assistant Secretary, State Charities Aid Association.

Dr. Frank G. Boudreau, Chairman, Committee on Nutrition in Industry, National Research Council.

Mr. Mark A. Daly, Executive Vice President, Associated Industries of New York State, Inc.

Dr. Elizabeth N. Gardiner, Chairman, New York State Nutrition Committee.

Mr. Thomas J. Lyons, President, New York State Federation of Labor.

Professor C. M. McCay, New York State College of Agriculture.

Mr. G. H. Pfeif, Supervisor of Personnel, General Electric Company.

Mr. John Sloane, Chairman, Committee on Public Health and Welfare, New York State Chamber of Commerce.

Mr. Gustave A. Strebel, President, New York State Industrial Union Council.

Mr. Lazare Teper, Director, Research Department, International Ladies' Garment Workers' Union.

ACKNOWLEDGMENTS

The Committee expresses its appreciation to the hundreds of individuals who assisted and cooperated in its work. Particularly does it thank the United States Ambassador to Great Britain, Mr. John G. Winant; Lord Woolton, British Food Minister; officials of the State War Nutrition Service, the various schools and colleges at Cornell University, whose work concerns nutrition, and those persons who have contributed studies to this report.

CONCLUSIONS AND RECOMMENDATIONS

Nutrition involves fundamental economic policy. It also involves psychology, sociology, and the sciences of medicine and chemistry. It is affected by farming practices, manufacturing processes, transportation, refrigeration and storage of food, marketing outlets, consumer education, and many other factors.

To the normal complexities of nutritional problems, we must, for proper perspective, add the new complications arising from World War II. Our country has embarked on a gigantic rationing program. Food surpluses have disappeared and shortages in certain foods have become marked. Prices have risen, despite price ceilings. A "black market" in food is feared. Housewives are

being called upon to alter traditional buying and cooking habits. At Washington, new governmental agencies are being created to cope with wartime food problems.

In this period of shift and transition, it is most difficult to chart recommendations for the state. However, some facts are clear. Food is power. Food can help not only to build a stronger, healthier people, but it can speed the output of tanks, planes, guns and ships vital to victory. Yet, a large portion of our people are not getting a balanced diet. Although there is a low prevalence of severe, acute malnutrition in this, the best fed nation of the world, there is a high prevalence of mild, chronic nutritional deficiencies. Hidden hunger, which impairs efficiency and morale, leaves us susceptible to infection and disease. In time of peace, this condition is deplorable; in time of war, it is a calamity.

We must recognize that nutrition is a proper and permanent concern of national, state and local governments. It lies with government, assisted by private agencies and supported by enlightened public opinion, to take the lead in bringing proper food within the reach of all of our people.

THE STATE AND NUTRITION

New York State already has numerous agencies concerned with nutrition. For example, the State War Nutrition Service is providing the central direction needed for effective use of existing state and local nutrition resources. The New York State Nutrition Committee is a valuable organization which has given our state the benefit of the advice and services of many experts and lay leaders.

We recommend :

1. **The state should place its nutritional activities on a permanent basis as soon as practicable.**
2. **The War Nutrition Service should be replaced by a central coordinating agency in the State Health Department.** This agency should be headed by a policy-making council of representatives of state departments concerned with nutrition. Creation of such a council will tend to eliminate the conflicts inevitable in coordinating a large number of separate governmental bureaus. The council should be appointed by the Governor, in order that it may have the prestige and influence necessary to coordinate the activities of the various departments. The council should appoint an executive secretary who shall be the administrative director of the agency. Staff functions such as clerical work, purchasing, etc., should be handled through the State Health Department, for the sake of efficiency and economy.

3. **There should be closer relationship between our state's nutrition and food production policies.** For example, New York State is a leading producer of protective foods, such as eggs, milk,

vegetables, and fruit. We have untapped fish resources. We could release transportation facilities and aid our own producers, if we emphasized in our nutrition program the healthful products of our own state, rather than urge use of substitutes from far-flung parts of our country. This is not provincial, but a patriotic duty in time of war.

4. The proposed central coordinating nutrition agency of the state should encourage local health departments to participate to a greater extent in nutrition. Many of our local health departments are not playing their proper roles in the nutrition activities of their communities.

5. Much of the nutritional research work conducted at the State College of Agriculture, the College of Home Economics and the School of Nutrition at Ithaca is of utmost importance, not only to the people of our state but to the whole nation. In the laboratories of these institutions, men and women are devoting their lives to improvement of the health of humans, and extension of life through the science of nutrition. **This research deserves the full support of our state.**

6. The Extension Service has long set up an excellent system of educating the adult population of our rural areas in homemaking and nutrition. But the Extension Service has not been able, with its limited staff, to serve the cities. Today, under the Civilian Mobilization Service of the State War Council, "block leaders" have been appointed in our cities to impart nutritional information to their neighbors. When war is over, this temporary block leader program will end. **We should plan now to enlarge the scope of the Extension Service to cover urban, as well as rural areas, when war is over.** The Extension Service should work in cooperation with local health departments.

7. Jurisdiction of the State Board of Pharmacy and the State Bureau of Food Control over inspection of vitamin capsules and vitamin-enriched foods is confused. The Board of Pharmacy should be given jurisdiction over inspection of the production and sale of vitamin concentrates and the Bureau of Food Control should be given jurisdiction over foods that are vitamin-enriched.

INDUSTRIAL NUTRITION

Data received by our Committee lays bare an appalling situation with regard to nutrition of war workers. For a variety of reasons elaborated in the second section of our report, large numbers of these soldiers of production are not receiving an adequate diet. If our arsenal of democracy is to do the job it is capable of doing, our war workers must get a balanced diet.

To this end, we recommend :

1. The first objective of New York State's nutrition policy should be that of improving the diet of our war workers. This should be Job No. 1.

2. The Industrial Code should be amended to require factory canteens in war plants. Nutritious meals at reasonable prices should be made available to workers.

3. War plants should be encouraged to serve between-meal snacks of nutritious foods.

4. Nutritional information should be distributed and taught to groups likely to become workers in war plants, such as state aviation schools, private trade schools, etc., and among workers in each plant.

5. War plants should cooperate with the state by adding brewer's yeast, a concentrated nutritional supplement, to the on-the-job diet of all workers. The cost is low, the benefit high. Brewer's yeast is a high-powered source of essential vitamin B complex. When added to canteen meals or lunch-box foods, it does not have the objections raised by many scientists to the furnishing of vitamin pills to workers. The War Nutrition Service is to be commended for pioneering in initiating the brewer's yeast program in our state.

6. War plants should cooperate in studies of influence of diet and nutrition on health, working capacity, incidence of accidents, absenteeism, and industrial unrest.

7. Food served in factory canteens should not be included under the rationing plan. While not conducive to national unity to provide war workers with supplementary ration cards, nutrition of workers can be protected by assuring factory canteens of adequate food supply and by not depriving the worker of his ration points for food consumed at factory canteens.

8. Major responsibility for administration of the nutrition program in industry should rest on the Division of Industrial Hygiene of the State Labor Department, acting under the direction of the proposed central state coordinating agency.

THE PENNY MILK PROGRAM

The penny milk program, initiated by the federal government, operates in cooperation with local communities, and now serves thousands of children within New York State. One of the most important steps that can be taken by government to raise the standard of health of the growing generation is to arrange for cheap distribution of safe milk to school children.

We therefore recommend :

1. Every effort be made to continue the penny milk program and extend it to the many schools not covered.

2. In the event of milk shortages or milk rationing, deliveries of milk to schools should be given priority, and should be considered as supplemental to the child's regular ration.

3. Responsibility should be delegated to a single state department for development of the school-milk program. At present, a number of departments are interested in the school-milk program, but there has been no centralization of authority.

4. If the penny-milk program is endangered due to financial reasons, the state should consider giving financial assistance in areas unable to sponsor the program.

5. A full day's requirement of vitamin D should be added, as soon as practicable, to school milk. The cost would approximate 1/40th of a cent per half-pint of milk. More than 80 per cent of our school children have decayed teeth. Vitamin D helps to prevent caries and rickets. It would be cheaper to add vitamin D to school milk than to supply to school children costly dental treatment which, for the most part, consists of an attempt to repair the ravages of already existent caries.

THE SCHOOL LUNCH PROGRAM

Thousands of children in the schools of our state are today receiving nutritious lunches at school. This program is not unique. Many countries have long supplemented the regular diet of school children by regular provision of free or cheap meals at school. Best known of these meals is the "Oslo breakfast," consisting of milk, bread or biscuits, butter and raw fruits or vegetables, all of which require no cooking or preparation at school.

The school lunch program within our state is a joint federal-local effort. Food is furnished by local authorities with partial financial assistance from the United States Department of Agriculture, and personnel is assigned by the WPA. With abandonment of WPA, scheduled for this year, it is feared that the school lunch program will be endangered.

We recommend:

1. Every effort should be made by the state to see to it that the school lunch program is continued and expanded.
2. The federal government should grant food priorities for school lunches and they should be considered supplemental to the regular ration.

FLUORINE AND DENTAL CARIES

Unusually low prevalence of dental decay has been found in communities where drinking water has a fluorine content of about one part per million. This offers new hope for striking at dental decay. The Committee consulted the United States Public Health Service and other authorities to determine the feasibility of requiring communities to add fluorine to their drinking water. For the present, however, it seems desirable to await the results of current experiments.

We recommend:

1. Local communities should cooperate with Federal health officials' fluorine experiments.
2. Study should be conducted by the State Health Department to take advantage quickly of the experiments in fluorine.

CONTINUATION OF THE COMMITTEE

In view of new developments which directly affect food production, transportation, marketing and consumption, it is essential that the Joint Legislative Committee on Nutrition be permitted to continue its work.

We recommend:

1. **The life of the Committee should be extended to March 1, 1944, in order to:**
 - (a) Study and investigate the new rationing system, with a view to securing for the people of our state an adequate supply of food.
 - (b) Investigate development of the black market in food and recommend means of combatting it.
 - (c) Investigate shortages of food, and recommend means of securing an adequate supply.
 - (d) Continue its studies of industrial nutrition, and the nutritional activities of the state.
 - (e) Embark on a study of waste in the commercial handling of food.
 - (f) Investigate the nutritional policies and practices of our state institutions.

REPORT

The report of this Committee* is divided into two parts. The first part consists of this letter of transmittal. The second part consists largely of reports of studies and investigations prepared for the Committee by various authorities and compiled under the direction of Albert J. Abrams, Assistant to the Chairman of the Committee.

Respectfully submitted:

State Senator Thomas C. Desmond, Chairman
Assemblyman Jerome C. Kreinheder, Vice-Chairman
State Senator Edward J. Coughlin, Secretary
State Senator Perry B. Duryea
State Senator Gilbert T. Seelye
Assemblyman Benjamin H. Demo
Assemblywoman Edith C. Cheney

February 18, 1943.

* James G. Lyons, former Assemblyman, was a member of the Committee for several months.

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►Our Committee is indebted to the Office of War Information, British Information Service, United States Department of Agriculture, Look Magazine, The New Yorker, and King Features Syndicate Inc. for permission to reproduce various illustrations contained in this report. Our Committee is indebted also to Look Magazine for permission to reproduce Don Wharton's article on school lunches.

Introduction

By Thomas C. Desmond

Chairman, New York State
Joint Legislative Committee on
Nutrition



Wheat, weapon of war, is inspected by two young farmers who are helping to produce food for victory

WAR has awakened governments to the simple fact that food in large measure controls the destinies of nations. The role of nutrition in our modern civilization is paramount.

Whether our Armies can roll back the forces of evil depends in part upon whether they eat health-giving, energy-full meals. Whether we shall be able to send enough tanks, guns and planes to our fighting men depends in part upon whether our war workers consume enough nutritious food. Whether the youngsters now at their A, B, C's in our schools will grow into strong adulthood depends in part upon whether they receive a balanced diet. The Axis has been using food as a weapon to enslave conquered peoples. We are planning to use food to help feed the peoples of many lands when the war is won. Food is fundamental.

The science of nutrition, which is pushing forward each day the frontiers of our knowledge of food, has taught us that good nutrition pays for itself. For every dollar properly invested by government in improving the nutritional status of our people many more dollars are returned in increased productivity, vigor and health. And yet, our federal government, our states and our local communities have as yet only dabbled in nutrition.

We are told in many posters, bulletins and advertisements that food is power, that food can win the war and write the peace. But today, three years after the first national nutrition conference was held in Washington, we still lack a national nutrition policy. The school lunch program is menaced by recurrent crises; the



The penny-milk program has helped build stronger, healthier citizens of tomorrow

government hedges regarding vitamin feeding of war workers; rationing is conducted with only inadequate acknowledgment of the nutritional needs of our people; federal bureaus, divisions and offices relating to nutrition are shifted about in Washington with confusing rapidity. How many more of our youths must be rejected as unfit by the Army because of defects due directly or indirectly to malnutrition, before we treat nutrition not as a temporary fad, but as a permanent and proper function of government?

So intertwined is nutrition with agriculture, education, health, transportation and marketing, not to mention international economics and politics, that the administration of the nutritional function requires statesmanship of highest order. It requires above all, perhaps, an ability to harmonize divergent viewpoints and secure the cooperation of large numbers of people.

Within the covers of this book, we present a selected number of reports by nutritional experts. We have not attempted to cover the whole field of nutrition. This is neither a book of menus nor a nutrition text-book. It is rather a compendium of reports embracing some of the main nutritional problems that are of particular and immediate concern to New York State. We hope other states will also find it valuable. Above all, we hope it will stimulate government officials to awaken to the many opportunities nutrition offers in building a victorious and greater America.

What is an Adequate Diet?

By Mrs. Marguerite Harper

New York State College of Home Economics

Before we attempt to discover what we can do to improve the diets of our people, we need to know what is an adequate diet. The following report answers that question. It reveals that we Americans customarily do not drink enough milk nor eat enough vegetables for robust health. We consume too much fats, sugar, cereals and bread. Wartime conditions may alter these eating habits.

HUMAN beings need food for energy, building and maintenance of body tissue, and for regulating the normal functions of the body. These needs are supplied by substances known as proteins, fats, carbohydrates, water, mineral matter and vitamins. When all these substances are received in sufficient amounts the result is an adequate diet—which is essential for health and vigor. If any nutrient is lacking, the penalty varies from minor ailments such as indigestion, eye trouble, defective teeth, bleeding gums, sores at the corners of the mouth, or the penalty may be more serious leading to incapacity, severe pain and even death. Primitive people knew little or nothing about the essential nutrients, yet through trial and error they found combinations of foods that provided the necessary nutrients. The Egyptians and Chinese knew as early as 1500 B.C. that livers of animals improved vision in dim light.

The Aztec Indians in Mexico have lived for years on corn, beans and squash as their basic diet. These foods supply ample energy



Baked beans, bread and milk do not provide a balanced diet

but are low in vitamins and minerals. How could these Indians keep healthy and survive on this inadequate diet? The answer lies in the fact that in addition to beans, corn, and squash these Indians,—men, women and children—drank quantities of a liquor called pulque. Pulque, which is made from the juice of the century plant, contains alcohol in amount about equivalent to that of strong beer. A few years ago, due to a prohibition movement, the government prohibited the making of pulque. The Indians, in the area where pulque was banned, became ill. Analysis of pulque showed that it contained the vitamins and minerals lacking in a diet of corn, beans and squash alone. In order to be adequately fed, these Indians need the juice of the century plant or its equivalent in fruit, green vegetables and milk.

Table 1 shows the specific nutrients and the daily allowance for various ages and activities as recommended by the National Research Council May, 1941. "Allowance" means a diet that is safely adequate.

The energy value of food is measured in calories. The requirement varies with the size and activity of the individual. The greater the muscular activity the greater is the need for energy to carry on this activity. All "foods" contribute some calories. In general, the higher the proportion of water and cellulose, the lower the caloric value. But the caloric value of the remainder differs because of its composition. Proteins and carbohydrates contribute 4 calories per gram, while fat contributes 9 calories per gram.

The story of the Aztec Indians illustrates the need for nutrients other than calories. Therefore, it is wise to obtain your calories from foods which contain other needed nutrients as well. For example, cereal products contribute about one-fourth of our calories. If these are eaten in the form of refined products they contribute little but calories, whereas if whole grain cereals or enriched cereal products are eaten one gets an appreciable amount of vitamins and minerals in addition to calories and protein. Likewise white sugar, which contributes about one-seventh of our energy, gives nothing but calories while the unrefined sweets such as molasses, and dark corn syrup, are good sources of iron and calcium.

Table 2 shows why the body needs certain nutrients and what foods supply them.

Many minerals which are needed by the body are not included in Table 2. These are needed in small amounts and occur in enough foods so that if one is on a mixed diet he is probably getting a sufficient amount of them.

The frequency with which milk, fruits, vegetables, eggs, and meat—especially glandular tissue—appear in the "sources" column of Table 2 explains why they are called "protective foods" and why we stress their need in our daily diet.

Recommended Daily Allowances for Specific Nutrients*

Committee on Foods and Nutrition, National Research Council

VITAMINS									
Calories	Protein	Calcium	Iron	A**	Thiamin (B ₁)***	Ascorbic Acid (C)***	Riboflavin	Niacin (niacin acid)	D
3000	70	0.8	12	5000	75	2700	18	18	.....
4500	76	0.8	12	5000	75	3300	23	23	(+)
2500	70	0.8	12	5000	75	2200	15	15	.....
Man (70 Kg. or 154 lbs.):									
Moderately active.....									
Very active.....									
Sedentary.....									
Woman (56 Kg. or 123 lbs.):									
Moderately active.....									
Very active.....									
Sedentary.....									
Pregnancy (latter half).....									
2500	85	1.5	15	6000	1800	100	2500	18	400-800
Lactation.....									
3000	100	2.0	15	8000	2300	150	3000	23	400-800
Children up to 12 years:									
Under 1 year (++)									
100 per Kg. 3-4 per Kg.									
1200	40	1.0	6	1500	400	30	600	4	400-800
1600	50	1.0	7	2000	600	35	900	6	.....
2000	60	1.0	8	2500	800	50	1200	8	.....
2500	70	1.2	10	3500	1000	60	1500	10	(+)
1 to 3 years									
4 to 6 years									
7 to 9 years									
10 to 12 years									
Children over 12 years:									
Girls 13 to 15 years.....									
2800	80	1.3	15	5000	1400	80	2000	14	.....
2400	75	1.0	15	5000	1200	80	1800	12	(+)
Boys 13 to 15 years.....									
3200	85	1.4	15	5000	1600	90	2400	16	.....
Boys 16 to 20 years.....									
3800	100	1.4	15	6000	2000	100	3000	20	(+)

* These are tentative allowances toward which to aim in planning practical diets. These allowances can be met by a good diet of natural foods; this will also provide other minerals and vitamins, the requirements for which are less well known.

** Requirements may be less than these amounts if provided as vitamin A, greater if chiefly as the pro-vitamin carotene.

*** 1 International Unit thiamin equals 3 micrograms; 1 mg. ascorbic acid equals 20 International Units; 1 International Unit equals 1 U.S.P. unit.

+ Vitamin D is undoubtably necessary for older children and adults. When not available from sunshine, it should be provided probably up to the minimal amounts recommended for infants.

++ Needs of infants increase from month to month. The amounts given are for approximately 6 to 18 months. The amounts of protein and calcium needed

are less if from breast milk.
+++ Allowances are based on the middle age for each group, (as 2, 5, 8, etc.) and for moderate activity.

TABLE 2
Some Functions and Sources of Nutrients

Nutrients	Function	Some Sources
Carbohydrates and fats	To furnish energy for all body activities during active and sleeping hours. To provide heat for maintaining body temperature.	Carbohydrates: Sugars, jams, jellies, starches, grain products, cakes, dried fruits, potatoes, corn, bananas. Fats: Butter, cream, cheese, lard, vegetable oils, nuts, bacon, egg yolk, ice cream, milk
Proteins	To build new tissue. To maintain mature tissue. To form hemoglobin for red blood cells. To form hormones and enzymes needed to regulate many internal body processes. To supply energy.	Meat, liver, kidney, heart, poultry, fish, most shellfish, cheese, dried milk, skim milk, malted milk, milk, evaporated milk, eggs, breads, cereals, peas, beans, and lentils.
Calcium	For bones and teeth, soft tissue, for regulatory functions. Regulates heart beat, aids in clotting of blood.	Whole milk, sour milk, buttermilk, skim milk, dried milk, evaporated milk, cheese.
Phosphorus	For bones and teeth, soft tissue, for regulatory functions.	Meat, fish, dried beans, milk, egg, whole grain cereals.
Iron	Formation of hemoglobin	Liver, oysters, apricots, eggs, green leafy vegetables, lean meat, dried beans, peas, whole grain cereals.
Copper	Formation of hemoglobin. Is present in muscles, bones, liver, and blood.	Liver, oysters, molasses, leafy vegetables, legumes, apricots.
Iodine	Proper functioning of thyroid gland.	Sea foods and cod liver oil, iodized salt.
Vitamin A and its Precursors	For growth. For good vision in semi-darkness. For formation and maintenance of good teeth, bones, skin and nerves. For maintenance of normal resistance to infection in many parts of the body. For successful reproduction.	Liver, egg yolk, fat fish, cheese, milk, butter, cream, spinach, chard, kale, turnip tops, dandelion greens, broccoli, sweet potatoes, winter squash, peppers and apricots.
Thiamin (vitamin B ₁)	For growth. For maintenance of normal appetite. For good digestion. For normal functioning of nerves and intestinal tract. For efficient use of carbohydrates by the body. For prevention of beri-beri.	Pork, glandular organs as heart and liver, whole grain cereals, legumes such as peas, beans and lentils, nuts and green vegetables such as green corn, green peas, asparagus and Brussels sprouts.
Riboflavin (B ₂ or G)	For growth. For general health and vitality. For health of the eyes, skin and digestive and nervous systems. To prevent certain types of lesions about the mouth and face. Essential in cell respiration.	Kidney, liver, heart, milk, lima beans, soy beans, spinach, turnip tops, kale, beet greens, and eggs.
Niacin (nicotinic acid)	For preventing pellagra. For healthy nervous system. For normal functioning of gastrointestinal tract. For normal functioning of the skin.	Liver, heart, salmon, lean meat, milk, spinach, tomatoes, green peas, kale, turnip greens and eggs.

TABLE 2 (*concluded*)

Nutrients	Function	Some Sources
Ascorbic Acid (vitamin C)	Essential for preventing and curing scurvy. For growth and maintenance of good teeth and bones. For healthy gums. For the formation and maintenance of cement substances securing body cells in position. For normal strength of capillary walls.	Greens such as turnip, dandelion and spinach, citrus fruits such as oranges, grapefruit, tangerines and lemons, also tomatoes, strawberries, cantaloupe, pineapple, green peppers and cabbage.
Vitamin D	Essential for building and maintaining strong bones and teeth. For preventing rickets in infants and softening of bones in adults. For good growth. For efficient utilization of calcium and phosphorus.	Fish liver oils, liver, egg yolk and butter.

Each nutrient can be supplied from many foods which contain it. So many combinations of foods will make an adequate diet.¹

Table 3 suggests common foods to include in the diet and shows how these foods meet the daily allowance.

This is only a suggestion of one method for insuring the necessary nutrients. When making substitutions or alterations, see that the nutrients from the food you withdraw are supplied by those added. A vegetable such as squash, corn, sweet potatoes or carrots might be substituted for potatoes; iron-rich vegetables might be stressed in the place of eggs.

Milk is a good source of calcium, phosphorus, protein, vitamin A and riboflavin. Dried whole milk or evaporated milk may be substituted for fluid milk. As incomplete substitutes, skim milk, buttermilk, or cheese may be used. Vitamin A is found in the fat and is therefore lacking in skim milk and buttermilk. Cheese is an excellent substitute for milk but it supplies less riboflavin and thiamin. If both milk and cheese are scarce, one should select the rest of the diet to be sure to include the necessary vitamin and mineral content.

Eggs contribute protein, riboflavin, vitamins A and D, and iron. Meats add protein, phosphorus, iron and thiamin. It is wise to include liver once a week in place of muscular tissue because it supplies all known vitamins and is an especially good source of iron, vitamin A, riboflavin, and protein. Fish give variety to the diet and are a good source of protein; seafish give iodine and, if fat, fish may add materially to the supply of vitamins A and D.

¹ For those who are interested, lists of foods supplying the necessary nutrients have been compiled in the form of weekly market lists for various income levels. They are "Market lists for low-cost meals" and "Market lists for moderate-cost and liberal meals", Bureau of Home Economics, United States Department of Agriculture.

TABLE 3
DAILY Food FOR AN ADULT

Foods to Include Daily	Amount	Calories	Protein	MINERALS			VITAMINS		
				Calcium	Phosphorus	Iron	I. U. (1)	Milligrams (2)	Riboflavin
Milk.....	1 pint.....	320	grams (1)	grams (1)	mg (2)	I. U. (1)	0.29	mcg 100	
Eggs.....	1.....	85	16	0.57	1.2	500	0.05	165	
Meat.....	1 serving.....	200	7	0.03	1.6	500	0.10	4750	
Fruit, raw†.....	1 serving.....	24	0.02	0.23	4.0	Appreciable amount	0.06	40	
Fruit, cooked.....	1 serving.....	55	.....	0.01	0.2	.....	0.10	.....
Potato.....	1 serving.....	110	.....	0.01	0.03	0.8	0.05	16	
Potato.....	1 serving.....	170	4	0.02	0.11	1.8	0.14	20	
Vegetables, cooked.....	1 serving.....	40	1	0.05	0.04	0.6	0.04	50	
Vegetables, raw.....	1 serving.....	10	.....	0.04	0.05	0.8	1000	110	
Whole grain cereal and bread.....	2 servings.....	340	11	0.03	0.20	2.5	0.40	40	
Butter.....	1 ounce.....	220	.....	.....	.....	1000	.....	50	
Total.....	.....	1500	63	0.79	1.25	13.5	6000	1.09	86
Amounts recommended.....	.....	*2000- 3500	60- 70	0.8	1.3	12	5000	1.00- 2.00	70- 75
								1800 to 2300	2325

* Additional food to meet the energy requirement, according to taste, from the following:
Second helpings of any of the above foods

Salad oils and other fats
Sugar, jam, and sweet desserts.

Rolls and crackers

† One serving of fruit should be citrus fruit unless tomatoes are used that day.

1 gram = 1/30 ounce.

2 1 milligram = 1/1000 of a gram (less than the weight of the proverbial "mustard" seed).

3 1 International unit of vitamin A = 6/10,000 milligram of carotene.

4 Includes liver once a week.

Courtesy of Alice Blood: *What to Eat and Why*, John Hancock Mutual Life Insurance Company of Boston, Massachusetts.

Fruits and vegetables contribute the water soluble vitamins. Raw fruits, especially citrus fruits and tomatoes, contribute vitamin C. Dried fruits supply appreciable amounts of iron. Green leafy vegetables supply vitamins A and C, considerable riboflavin, iron and an appreciable amount of calcium.

Whole grain cereals, in addition to calories and some protein, contribute iron and thiamin.

Butter gives vitamin A as well as energy. If substitutes are used, it should be a fat that is reinforced with vitamin A. In case of a shortage of butter and reinforced fats, fish liver oils could be used as excellent sources of vitamin A.

Sugar contributes only calories and should be used sparingly.

The important point to remember in planning diets is that it is not necessary to adhere to any certain food or list of foods, but rather to include the necessary nutrients.¹

When planning adequate diets we usually plan on an individual basis, or family basis. It is possible, also, to calculate the food needs of the "national family". Table 4 gives the per capita requirement of various foods using the Bureau of Home Economics moderate cost diet as a standard. By comparing these figures with the actual consumption, it shows which foods we need more of, and what they should replace, if the nation is to be well fed.

TABLE 4

THE PER CAPITA FOOD REQUIREMENT COMPARED WITH PER CAPITA CONSUMPTION ²

	Unit	Moderate cost diet per capita requirements	Actual consumption (1936-1940 average)	Short	Over
Milk and milk products.....	Quarts	300	167	133	.....
Leafy green and yellow vegetables.....	Pounds	166	73	93	.....
Potatoes — including sweet.....	Pounds	155	149	6	.....
Tomatoes and citrus fruits.....	Pounds	100	97	3	.....
Meat, poultry, fish.....	Pounds	134	131	3	.....
Eggs.....	Dozens	25	24	1	.....
Beans, peas, nuts.....	Pounds	12	12	0	0
Other vegetables and fruits.....	Pounds	195	221	.....	26
Sugars.....	Pounds	57	75	.....	18
Fats.....	Pounds	57	67	.....	10
Cereals and bread.....	Pounds	186	196	.....	10

¹ The nutritive value of average servings of common foods may be obtained from the New York State College of Home Economics at Cornell University, Ithaca, New York.

² Figures from NRPB study, *Land Use Planning for Nutritional Needs*, March, 1942. Figures adjusted to allow for children's diets. As used in "Goals for America" by Stuart Chase. Published by the Twentieth Century Fund, 1942. Courtesy of publishers.

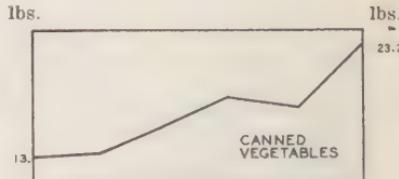
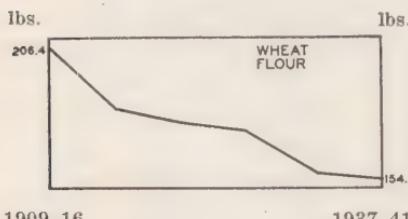
Recent Trends in Food Consumption

By Mrs. Marguerite Harper

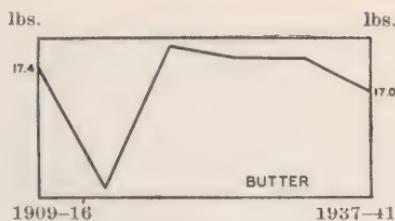
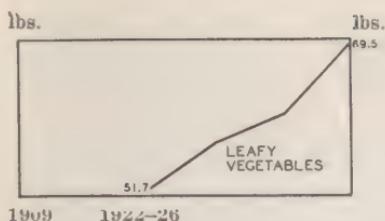
New York State College of Home Economics

Have we changed our eating habits during the past three decades? Yes, says the following report. The American of today eats more sugar and dairy products than did his father. He drinks more citrus fruit juices and more coffee. He consumes about the same amount of meat and eggs, less cereals and potatoes but about the same total amount of food. Charts illustrating the following article are based on figures of Oris V. Wells, United States Bureau of Agricultural Economics.

TO measure exactly the amounts of food eaten by all families in the State or Nation is a difficult if not impossible task. Consequently, figures on food consumption of the national family must be based on estimates. Table 2 shows the average per capita consumption of different foods with the various changes in kinds over a period of time. The estimates are from such figures as crops harvested, livestock products produced, and livestock slaughter, making adjustments for food used as seed, feed for livestock, food imported and food exported. The estimates show that over a period of time the quantity of food in pounds which has been consumed per capita has remained fairly constant but that the kinds of food have changed considerably.



The figures in Table IV of the preceding chapter are the most complete "consumption" figures available for the United States. They are based on all available sources of information on the subject from the United States Department of Agriculture, the United States Department of Commerce, and other sources. Yet they give consumption in an economic sense rather than as a nutritionist would speak of consumption. The figures tend to show disappearance into channels of distribution for human food. But much of this does not actually reach the human stomach. Some spoils on its way to market, some is lost in various forms of processing or "refin-



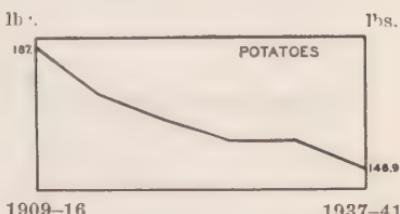
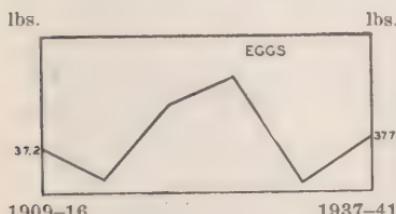
ing", and some finds its way into the garbage pail or into the dog's or cat's food dish. A partial adjustment of this type has been made, and is shown in Table 2, for 1941.

Table 2 shows the proportion of calories from different foods. The calories, or energy value of food, has often been used as a basis for comparison. It must be remembered that this does not give but one aspect of food value, the energy value.

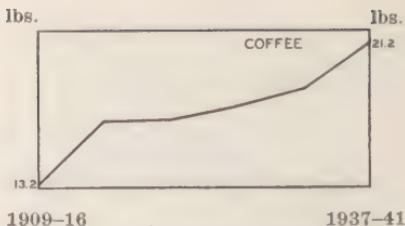
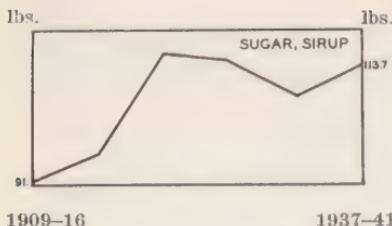
Cereals supply over one-fourth the total calories; meat, chicken and egg one-fifth; dairy products, excluding butter, one-tenth; fruits and vegetables including potatoes also one-tenth; butter and other fats one-sixth; and sugar one-sixth.



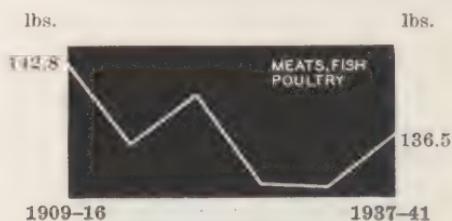
Potatoes and cereals are relatively inexpensive sources of calories. They are typical of diets of low income countries all over the world. **When these two commodities are combined they furnish Americans nearly one-third of their total calories.** Bennett used these foods as an indirect measure of the standard of living of a country. He finds that most people in the world consume more than 80 per cent of their total calories from foods of the cereals and potato type.¹



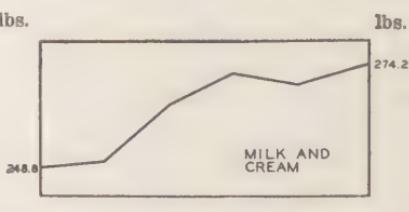
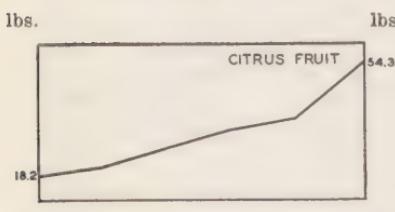
¹ Bennett, M. K. International Contrasts in Food Consumption. *Geographical Review*, July, 1942.



Calories are only one way of appraising what we eat. Although calories are essential for energy they alone are not sufficient. We need protein to build tissue and there is no substitute for that purpose, fat is an energy food with excellent "staying" qualities which prevent hunger for some time and recent studies indicate that some fatty acids are indispensable nutritionally. Both minerals and vitamins are needed for good health; even though the amount needed is small.



Since a high proportion of our food comes from cereals, it is wise from a nutritional standpoint to see what they give us in addition to calories. In colonial days these cereals were consumed as whole grain cereals so that the consumers obtained the full food value of the entire kernel. Unfortunately, later when techniques were developed for the refinement of cereals, the public seemed to consider the refined form as something to be desired. Perhaps they thought of it as a sign of a higher standard of living. As a result most of our population has acquired a taste for refined cereals. **By 1940**



only 2 per cent of the flour milled in the United States was whole grain. What does this refinement do to the food value of our diet?

An analysis of the low income diet in America in 1851 showed it to contains 2,306 calories, 92 grams protein, 0.26 grams calcium, 24 mg. iron, 1,224 I. U. of vitamin A, 45 mg. of vitamin C and 2.53 mg. of thiamin. In comparison the workingman's diet by 1926 provided 2,740 calories, 92 grams of protein, 0.61 grams of calcium, 13 mg. of iron, 1,774 I. U. of vitamin A, 62.5 mg. of vitamin C and 1.4 mg. of thiamin.

It will be noted that over this period of time there was a considerable increase in calcium, vitamin C and some increase in vitamin A. These increases are undoubtedly due to the increased consumption of milk, fruit and vegetables (Table I). It will also be noted that between 1851 and 1926 there was a decided decrease in iron and thiamin intake. It is the use of highly milled cereals and refined sugar that are largely responsible for this decrease. It is to replace a part of this loss that we now have enriched bread. According to a report by Cowgill in 1939, the cereal grains, largely as undermilled flour and rich in thiamin, formerly contributed 50 to 55 per cent of the calories of the average American diet, and that recently flour contributes about 25 per cent, with the difference mainly made up by sugar.

If a large proportion of our food consumption is highly milled cereal and refined sugar, it is of utmost importance that the other portion of our foods be selected with care. It is also desirable from the standpoint of good health that the consumption of foods which contribute little other than calories (such as refined flour and sugar) should decrease, whole grain cereal or enriched cereal be used; also that the highly nutritious foods such as dairy products, fruits and vegetables should increase.

At present there are demands for food for the armed forces, and for Lend-Lease in addition to civilian use. As the war progresses more changes will develop. Transportation facilities are overburdened so that long distance shipping of many foods will be curtailed and the consumer will have to depend more on food produced at or near home.

TABLE 1
CHANGES IN QUANTITY OF FOOD CONSUMED (ALL AGES) UNITED STATES

	QUANTITY PER CAPITA, POUNDS		CHANGE	
	1909-13 Ave.	1935-39 Ave.	Pounds	Per Cent
Cereals:				
Wheat	299.2	222.4	-76.8	- 26
Corn	125.2	67.6	-57.6	- 46
Other	74.9	47.6	-27.3	- 36
Total	499.3	337.6	-161.7	- 32
Dry beans	7.2	9.7	+ 2.5	+ 35
Meats:				
Beef and veal	75.1	62.9	-12.2	- 16
Pork	66.3	56.2	-10.1	- 15
Lamb and mutton	7.1	6.8	- 0.3	- 4
Chickens (dressed wt.)	20.1	18.6	- 1.5	- 7
Turkeys (dressed wt.) (no inf.)		2.6	+ 2.6	..
Total	168.6	147.1	-21.5	- 13
Eggs	38.5	36.9	- 1.6	-
Dairy products*				
(other than butter):				
Fluid milk and cream	319.6	346.2	+26.6	+ 8
Mfg., other than butter	61.6	117.6	+56.0	+ 91
Total	381.2	463.8	+82.6	+ 22
Fats and oils:				
Butter	17.6	17.0	- 0.6	- 3
Lard	11.7	11.1	- 0.6	- 5
Other	12.6	19.9	+ 7.3	+ 58
Total	41.9	48.0	+ 6.1	+ 15
Fruits:				
Apples, fresh	66.7	41.8	-24.9	- 37
Citrus, fresh	18.7	50.3	+31.6	+ 169
Other, fresh	61.9	61.2	- 0.7	- 1
Total, fresh	(147.3)	(153.3)	(+ 6.0)	+
Fruits (other than fresh):				
Canned	3.6	13.8	+10.2	+ 283
Dried	4.0	6.0	+ 2.0	+ 50
Juices	0.3	4.3	+ 4.0	+1333
Total (fresh equiv.)	(12.2)	(47.2)	(+35.0)	+287
All fruits (fresh equiv.)	159.5	200.5	+41.0	+ 26
Vegetables:				
Potatoes (fresh)	189.4	145.4	-44.0	- 23
Sweet potatoes (fresh)	33.7	31.8	- 1.9	- 6
Other (fresh)	229.0	254.8	+25.8	+ 11
Tomatoes, canned (excl. juice)	5.9	5.8	- 0.1	- 2
Corn, canned	3.2	4.1	+ 0.9	+ 28
Peas, canned	1.8	4.7	+ 2.9	+ 161
Other (incl. tomato juice)	3.4	10.5	+ 7.1	+ 209
Total (fresh basis)	486.6	472.3	-14.3	- 3
Sugar	82.2	103.6	+21.4	+ 26
Beverages:				
Coffee	9.4	14.0	+ 4.6	+ 49
Tea	1.0	0.7	- 0.3	- 30
Cocoa	1.4	4.4	+ 3.0	+ 2.4
Total	11.8	19.1	+ 7.3	+ 62
Total, all foods	1876.8	1838.6	-38.2	- 2

* Milk equivalent basis.

Courtesy of F. A. Harper, Department of Agricultural Economics, Cornell University.

TABLE 2
CONSUMPTION OF AGRICULTURAL PRODUCTS PER CAPITA, CONTINENTAL
UNITED STATES, 1941

	POUNDS PER CAPITA PER YEAR			Calories per pound edible portion ⁵	Per cent of total calories consumed
	" Consumed " ¹	By-products and refuse	Eaten		
Wheat.....	Pounds 223	Pounds ² 67	Pounds 156	Pounds 1,615	Per Cent 19.1
Corn.....	67	² 23	44	1,690	5.6
Rice.....	6	.....	6	1,590	0.7
Other cereals.....	34	³ 12	22	1,600	2.7
Potatoes.....	144	^{2,4} 44	100	385	2.9
Sweet potatoes.....	21	^{2,5} 7	14	565	0.6
Fresh vegetables.....	252	³ 75	177	200	2.7
Canned vegetables.....	30	.....	30	300	0.7
Dry beans.....	10	² 1	9	1,545	1.0
Fresh citrus.....	64	⁶ 18	46	230	0.8
Fresh apples.....	42	⁶ 5	37	290	0.8
Other fresh fruit and juices.....	74	.....	74	200	1.1
Canned fruit.....	19	.....	19	300	0.4
Dried fruit.....	6	.....	6	1,300	0.6
Beef and veal.....	71	⁶ 12	59	1,220	5.4
Pork.....	70	⁶ 8	62	2,420	11.3
Lamb and mutton.....	7	⁶ 2	5	1,420	0.5
Fish.....	15	⁶ 5	10	445	0.3
Chicken and turkey.....	24	⁶ 10	14	560	0.6
Eggs.....	38	⁶ 4	34	715	1.8
Milk.....	353	.....	353	310	8.2
Condensed milk.....	20	.....	20	630	0.9
Butter.....	17	.....	17	3,325	4.3
Cheese.....	6	.....	6	1,785	0.8
Other dairy, fluid milk.....	34	.....	34	310	0.8
Lard.....	14	.....	14	4,080	4.3
Other fats and oils.....	21	.....	21	4,080	6.4
Cocoa.....	5	.....	5	1,940	0.7
Sugar (raw).....	111	³ 8	103	1,805	14.0

¹ The National food situation, B.A.E., U.S.D.A., mimeographed, April, 1942.

² O. V. Wells, B.A.E., U.S.D.A.

³ Estimated by writers.

⁴ P. J. Findlen, Farm economics, Cornell, October, 1938, p. 2656.

⁵ Proximate composition of American food materials, U.S.D.A., Circular No. 549, 1940. Table from Journal of Farm Economics, August 1942. Courtesy of Lucille Williamson and Paul Williamson, Cornell University.

What Americans Should Eat But Don't

By Dr. George Gallup

Director, American Institute of Public Opinion

Little wonder that so many Americans are suffering from hidden hunger. This Gallup Poll shows what is missing from the daily diet of a representative cross-section of our people.

THE average American has much to learn about the most elementary of all human questions—what to eat.

In view of wartime shortage of doctors and civilian medical services, the maintaining of national health through sound, well-balanced diets is one of the major current tasks of health and nutrition authorities.

In order to discover how much the average American adult knows about simple nutrition rules and where an educational program may be needed, the American Institute of Public Opinion conducted a nation-wide survey in which a record of the principal foods eaten by representative adults in all States was obtained for a twenty-four-hour period.

The results were then compared with a list of essential health foods recommended by the Bureau of Home Economics of the Agriculture Department and other nutrition experts.

The comparison of food recommendations with how adult Americans live up to them is shown below. The figures represent the number of persons who ate none at all of the foods listed as necessary daily in each category:

Fruits and Raw Greens: Tomatoes, citrus fruits or juices, raw cabbage or salad greens—45 per cent had none.

Eggs: One a day—48 per cent had none.

Milk and Cheese—34 per cent had none.

Vegetables: Leafy green or yellow—25 per cent had none.

Meats: Meat, fish or poultry—12 per cent had none.

Other Vegetables (including potatoes) or Fruit—8 per cent had none.

Cereals or Bread: Whole grain or enriched—3 per cent had none.

The greatest deficiencies in the national diet are apparently the citrus fruits and raw greens, eggs and dairy products. The campaign of health authorities to induce people to eat more leafy green and yellow vegetables is apparently making progress. Three-fourths of all persons in the survey lived up to the rule. That Americans are a nation of meat eaters is likewise shown by the fact that only 12 per cent had no meat, fish or poultry.

Sharp differences in dietary habits were found by income groups. In the lower group the outstanding deficiencies, as compared to other income groups, were citrus fruits and raw greens, eggs, milk and leafy green or yellow vegetables. In the following table the figures show the percentage lacking food requirements:

	<i>Upper Income</i>	<i>Middle Income</i>	<i>Lower Income</i>
	<i>%</i>	<i>%</i>	<i>%</i>
Citrus fruits and greens.....	24	35	56
Eggs	45	43	52
Milk, cheese	27	26	40
Vegetables (leafy and yellow).....	19	21	29
Meats, fish, poultry.....	7	8	15
Other vegetables	6	6	10
Cereals or bread.....	3	2	3

Among geographical sections, the South shows a greater deficiency than any other section in citrus fruit and raw greens, while the New England and Middle Atlantic area shows greatest deficiency in milk or milk products. The following table shows results by sections, the figures giving the percentage lacking food requirements:

	<i>N.E. and M. Atl.</i>	<i>East Cent.</i>	<i>West Cent.</i>	<i>South</i>	<i>Far West</i>
	<i>%</i>	<i>%</i>	<i>%</i>	<i>%</i>	<i>%</i>
Citrus fruits and greens.....	46	41	43	53	41
Eggs	53	51	49	41	46
Milk, cheese	43	31	31	31	28
Vegetables (leafy and yellow).....	28	26	25	21	24
Meats, fish, poultry.....	9	12	12	14	14
Other vegetables	8	8	5	12	7
Cereals or bread.....	3	4	2	3	3

Factors Influencing Our Diets

By Earl Lomon Koos, Ph.D.

Research Director, Council of Social Agencies
Rochester, N. Y.

Man's choice of foods depends in large measure upon factors of which he is rarely conscious, such as family food patterns, customs and foreign cultures.



Many factors influence selection of food for the lunch box

war effort, but they are equally important in any program of social betterment, and are therefore likely to be our concern over a long period of time.

As someone has expressed it, "We eat what we learn to eat". This learning to eat, however, includes not only those things we are deliberately taught about food and the social patterns of eating while within the family circle, but also the equally important influence of factors such as custom and the cultural heritages. Any adequate discussion of man and his food habits must include the latter factors, and this is often overlooked by food scientists. There is a psychology, a sociology, and an anthropology—if you will—of food which we are only now coming to include in considerations such as these.

MAN's use of food is ordinarily thought of as an activity over which he exercises full and immediate control. Actually, man has so much pressure exerted upon him by a variety of factors, as present day scientific studies are demonstrating, that he exercises little choice in this most important life activity.

Our purpose here is to highlight certain of the more important of these factors in the hope that they will more often be considered in the planning and execution of nutrition programs. Not only are such programs necessary for the immediate

Family Food Patterns

"What the child learns at its mother's skirts, it builds into its life" runs an old Czech folk saying. What is meant really is that the life patterns of action which the child acquires come largely from within the home circle. The ways of doing things learned in early home life are in turn utilized in setting up new family structures. Modifications occur, of course, through education and social experience, but the early patterns persist in large measure. Our food likes and dislikes, prejudices, etc., are thus passed on from generation to generation and in many instances perpetuate the dietary faults of the past.

This inheritance of food patterns is familiar to all of us when we analyze our likes and dislikes. In a study of reasons for rejecting certain foods which have nutritional value, such as the glandular meats, we have found that in the case of two hundred and forty persons who state definitely that they will not eat these foods, one hundred and ninety-six (81 per cent) give as their reasons the fact that such items *were not included in their diet when they were children*. Their present use of foods, therefore, is strongly influenced by what they learned as children within the family circle. Our case studies are full of examples of faulty methods of cooking, bad eating habits—all of which have come down from earlier generations.

These are too often not considered as part of the nutrition pattern. The haphazard serving of food, as an example, which accompanies so much disorganized living has a direct effect upon the individual's regard for and use of food. Unfortunately, too, the individual tends to repeat in his own home these social patterns, and thus to perpetuate the problems from one generation to another.

A rural housewife, with whom we discussed the poor eating habits of her family (food was poorly cooked, placed on the table and eaten hot or cold by the six children at any and all hours), made the following illuminating statement:

"You ask why we don't have regular meals, not hot food? I've thought about doing it, but you know my husband and I both grew up that way and we're used to it so it just seems natural. I guess we're healthy, so why change?"

This is an extreme case, of course, but illustrates what exists in varying degree in most families. Unless definite educational measures are undertaken either with the parents while the children are in their formative years at home, or directly with the children in their educational and social contacts, we have no high nutritional standards in succeeding generations. This means that the great strides in the knowledge of nutrition which we are making today in America do no find their way into practical use.

This need for education of parent and child cannot be overstressed, for while we have tended to take food for granted and to

think of its connection with the life processes as incidental, modern research shows us that faulty diets have contributed much to human ills never directly associated with food.

Custom Affects Food Habits

A second factor, and one which extends beyond the family circle into the whole of society, is custom. William Summers said that "from his cradle to his grave, man is the slave of ancient usage." Many of our individual food habits originate not within any family circle, but are due to custom, local or nationwide. The American pattern of three meals a day, for example, as contrasted with the two, four, or even five meals a day of some other cultures, is one so well established for most of us that American soldiers on leave in England report difficulty in dealing with the English "tea" (which is usually a fourth meal). Night workers in defense plants are finding it difficult to adjust to an eating schedule which differs from their accustomed morning—noon—night routine of meals. In this connection, medical men state that there is no physiological reason for man's inability to eat at unusual hours—only the effect of habit and custom upon their lives produces this condition.

The New Englander away from home pines for his Saturday night baked beans, the Southerner wants his "greens and potlikker", the Cape Codder his creamed codfish, not only because of the family patterns of his youth but also, and in significant measure, because it is the custom of the region from which he comes. Whatever the particular region—the particular characteristics—this factor of custom must be taken into account in evaluating man's choice of food and his willingness to adjust his diet to harmonize with modern knowledge of nutrition.

Influence of Foreign Culture

A third important factor in man's choice of food is the influence of foreign cultures. Every foreign culture has its peculiarities as to foods—its likes and dislikes, its requirements, and its prohibitions. When individuals and families migrate to our shores, many of these distinctive features of the "old country" diet are brought with them and are adhered to as closely as opportunity and money will allow. We have only to visit stores in the foreign-born areas of even our small cities to find evidences of this demand for foreign food.

This heritage from other cultures is especially important to us in New York State. Twenty-four of every one hundred urban residents were reported in 1940 as having been born in foreign lands, and ten of every one hundred rural residents were likewise foreign-born. From the standpoint of nutrition programs, it means that this cosmopolitan make-up of our population increases the number of families in which foreign cultures affect the choice and use of foods.

This is not to be construed as an indictment of all foreign diets as contrasted with our own. As we shall point out below, there are definite values in most of these foreign diet patterns. It is intended, rather, to highlight one of the handicaps faced by nutritionists in setting up nutrition programs, especially in our own state.

There is no index or scale by which we can measure the influence of other cultures upon the diets of American families. The effect varies from family to family, from culture to culture, and persists in varying degree from generation to generation. The writer has studied some Irish families—three generations removed from the “ould sod” in which the pork—potato—cabbage—tea diet of the great-grandparents has persisted. These families have had long histories of illness, of early deaths, of general malnutrition, and yet have clung tenaciously to this inadequate and monotonous diet, so strong has been the influence of these cultural patterns. This persistence, incidentally, has continued despite the efforts of health and social workers to change the family’s eating habits. One of the Irish housewives in this group expressed her reasons for not changing in these words:

“**Sure, we use the same foods. Just because our people came to America years ago doesn’t mean we can’t be Irish in our eating! Many a fine lad grew to manhood on that food in Ireland—there’s no reason to change!”**

In direct contrast, we have found families only one generation removed from Ireland who have gladly utilized the best of American foods and food practices.

Some families in whom foreign cultural influences are very strong make decided efforts to become “American” through changing their food habits. One Hungarian housewife told of the change of food patterns in these words:

“**When we came to America, we wanted to become all American so we moved into an American neighborhood. We didn’t even eat like we used to—we ate pork and beans—everything else from cans—I fed my family just like American women do—it was pretty hard I tell you—to eat some of the stuff the store sold me. But we thought we had to, to be Americans.**”

This example presents the other extreme in adaptation to our culture. Between these extremes lie most of the families in this group, in which major elements of the food patterns persist for some two to three generations.

Each of these cultures had its positive values, and many have features that are detrimental. The Irish diet mentioned above, growing as it did out of the period when Ireland suffered periods of extreme deprivation, obviously leaves much to be desired in vitamin and mineral content.

The Italian peasant diet, on the other hand, with its high vegetable content and with its emphasis on cheese, has much to commend

it. Likewise, the Scandinavian use of fish, anathema to many of us, is especially satisfactory, yet Americans as a whole use, in normal times, less fish in their diets than is desirable.

Examination of the diet pattern of every one of the nationalities that today constitutes a part of America, and especially of cosmopolitan New York State, reveals the presence of these cultural influences, and indicates something of their weight in determining particular diets.

Psychological Values

There are psychological values attached to foods by many of us, values which have little or nothing to do with the nutritional quality of food, but which exert powerful influences upon food choices. One of the most important of these is the association of status with the use of certain food. The American culture is saturated with the desire and need for status—we as individuals are judged by what position we assume in life rather than by what we are. For this reason, many of our personal and social practices are directed at giving us position in life. We tend to use food as one means of attaining, in our own minds, this position.

Pork, a highly nutritious food, has long carried the connotation of being "a poor man's food", as have certain of the green vegetables, and therefore have not been accepted as items of the diet by large numbers of our people.

All meats tend to have this status value for us as a people. Certain foods have values associated with holidays, and are used on those days only; conversely, the inability to use them has certain negative effects. Space does not permit extended discussion of this factor. We can only point to the existence of such influences in the hope that they will be given greater consideration in planning. A contemporary example of this is the drive to increase the use of the dark breads of the wholewheat type, thereby hoping to rid us of the lacks found in highly-milled white flour. We know that this campaign has not had widespread acceptance to the degree it merits. The low-income groups, especially, tend to resist this substitution in their diets. When a study was made of reasons for such rejections, the following typical answers were given:

"Our parents came to America to better themselves, and to make things better for their children. Why should we eat vegetables?" (A 30 year old mother of a family, daughter of Polish immigrants)

"White bread? We never had that when we was down in Georgia—only corn bread—why should we eat brown bread now when we can afford white?" (A recently immigrated Negro mother of a family)

Here we find vivid demonstration of the fact that particular foods have qualities quite divorced from their actual contents, and that these qualities can weigh heavily in man's choice, most often without his being at all conscious of the values he ascribes to them.

We have only to examine recent events in connection with food distribution to have concrete evidence of the place these factors have in influencing man's diet. In the depths of the depression many foodstuffs were distributed to the unemployed, and there are frequent cases where families accepted these foods and then wasted or discarded certain of them. Investigation invariably showed that these foods were rejected because they were not part of the food pattern of the family and that the family's rejection could be traced to one or another of the factors discussed above.

A second evidence is found in the present difficulty some families are having with food shortages. Where substitutes are not in keeping with the general food patterns of the family, they are experiencing difficulty in making the adjustment to substitutes. In most instances these inabilities can also be traced to the above mentioned factors.

It would be unfair to suggest that these factors influencing food choices operate only in the case of low-income families or of families where foreign culture still exercise great weight. Upper-income family food patterns have not been subjected to as detailed study as have those of low-income families, but there are indications that the former leave much to be desired. Having the financial means to provide adequate diets does not mean that adequate diets are provided! In fact, it very often operates in quite an opposite manner. Where the sums available for food are more than adequate, the family diet very often includes those highly regarded luxury foods whose values leave much to be desired. The American culture, especially in its upper levels, suffers greatly from that chronic disease known as "keeping up with the Jones's". Some foods that are especially valuable for their vitamin, mineral, or other content are therefore rejected, and largely because they have become known as "a poor man's food." What has been said above regarding the use of foods as status-giving items in life applies especially among the upper income-groups.

Malnutrition and Income

It seems not inappropriate to discuss here what appears to us to be a popular misconception. It is generally believed that the malnutrition (according to present-day standards) which exists in a good portion of both our urban-rural population is due to its inability to purchase adequate amounts of food. Recent studies have shown that this is not necessarily the case. A recent cooperative study by Cornell University's Medical College, the U. S. Public Health Service, the Department of Health of New York City, and the Milbank Fund has concerned itself with the nutritional status of a group of low-income high school boys and girls. Findings of that study seem to indicate that it is neither the lack of available foods nor insufficient money spent for food that causes poor nutrition among low-income families. In most of the families the

amount of money spent for food could have provided, if wisely used, a diet adequate in almost every respect! It was the ill-advised choice of foods, the unwise spending of money, etc., that made it impossible for the family to maintain an adequate diet. The writer has reported, in his "Food In the Lives of Our Neighbors", the same situation existing among East Side families in New York City, and has recently found the same to be true of a number of rural New York families. In those families reporting insufficient money for food, for example, it is almost universally true that unwise proportions of the family income have gone for such items as soft drinks, prepared (and therefore expensive) foods, etc.

This is not intended to refute the idea that sub-standard incomes need to be increased if the health and general welfare of the nation is to be maintained at a high level! It is rather intended to point up the fact that the factors discussed earlier, namely family patterns, customs, cultural influences, and the uneconomic use of money (partially dependent upon the others), have greater proportionate weight than is ordinarily assigned to them. Therefore, these factors which militate against the adequate choice and use of foods must have primary consideration when nutrition programs are being set up.

It seems reasonable to conclude in the light of the foregoing discussion, that man's choice of foods,—his whole dietary pattern, in fact, depends in large measure upon factors of which he is rarely conscious, and over which he exercises little control. This conclusion seems, then, to point rather directly to education, or reeducation, as the case may demand, if we are to realize one of America's ultimate goals, a healthier and more adequately nourished population.

Changing Food Habits

By Dr. Margaret Mead ¹

Executive Secretary, Committee on Food Habits, the National Research Council

Nutritional education must emphasize not so much change in specific food habits but rather a change in our habits of thinking about food.

THE onset of World War II has coincided with a nation-wide drive to bring the dietary patterns of the United States into line with the findings of the science of nutrition. This attempt to change the traditional food habits of Americans and of those foreign background groups who have clung to their traditional European patterns, is comparable with the changes in domestic and public architecture which have followed upon the developments of the applied science of sanitation, or the changes in methods of education, and prison and hospital care which are accompanying the development of mental hygiene. As successive areas of human life are subjected to scientific inspection, an articulate will to alter traditional behavior so as to increase human well being has emerged.

The need for the application of the science of nutrition to the everyday dietary habits of the people is, moreover, greater under conditions of modern civilization than it may be presumed to have been in the past. Where primitive or simple agrarian peoples were able to live under stable conditions for a long period, dietary patterns were able to develop along trial and error lines, and those peoples who failed to achieve a reasonably good diet, in all probability succumbed to the onslaught of disease, or a stronger enemy.

But today, changes in living habits are so rapid that such long term adjustments do not occur; alterations in production methods—as in the manufacture of white flour and other “purified” products may become a widespread commercial practice, effecting adversely the nutrition of millions of people who are themselves merely continuing the food habits which in the past guaranteed them adequate nourishment. Rapid migration has resulted in disturbances in traditional food habits, as European peasants leave the land and a monotonous, but often balanced, diet and come to rely upon the commercially dictated stocks of the only store in some remote mining community. Rural people from the South move into northern cities where familiar greens are no longer available and substitute nothing for them.

Even under more stable conditions, we have abundant evidence that there are no automatic mechanisms in human societies which

¹ In this article Dr. Mead has drawn upon the materials prepared for her Committee, but this article does not constitute an official report of her Committee activities.



Dehydrated cabbage being dumped from trays, through a hopper, into a container



War has caused expansion of the dehydration industry. Dehydration affects a 10 to 1 reduction in the bulk of carrots, saves valuable shipping space

ensure an adequate diet for their members. Once such societies are removed from the drastic conditions of aboriginal life where famine and death from epidemic stare them in the face, it is possible, especially with ameliorations introduced by modern medicine, for a population to continue indefinitely on a very poor diet, a diet which increases the maternal and infant death rate, vulnerability to childhood disease, permanently stunts and distorts growth, and lowers human energy.

While experiments have shown that animals and human infants may make—if presented with a sufficient range of food elements—a better choice than can be made for them, by the time that the individual has been even partially educated in the traditional practices of his culture, he is no longer able to make nutritionally valid choices. Foods represent to him, not calcium or vitamin C of which his body is in need, but “breakfast” as opposed to “dinner”, “real white bread” as opposed to “the black bread of poverty” and “food that I like” as opposed to “what I ought to eat.” As food is used to express love, or mete out punishment, to signalize a festive occasion, to defy one’s wife or persecute one’s husband, to honor guests or subtly belittle guests of lower status, food becomes integrated with many other forms of behavior, and acceptances and resistances to food are no longer primarily oriented to the food itself, its taste, or its special nutrient virtues, either vaguely perceived or articulately recognized.

Traditional Food Uses

The traditional food usages of a society thus stubbornly hold either the poor choices or the good choices which have been and are being made by the members of that society. When the choices

have been good, then it is possible to point to the culture as conserving a good diet, and so to argue that if we could once establish a pattern in the United States of well balanced meals, containing the right amounts of foods, which taken together provided a good diet, then our only problem would be to be sure that every family was economically able to purchase the necessary foods, and was trained in methods of storing, preparing and serving them so as to utilize fully their food values. It is on the basis of this argument that campaigns to include a glass of milk in at least two meals or eat a green and leafy vegetable a day have been based.

Even in peacetime, when a reasonably stable supply of foods could be maintained, there were difficulties in such an approach, beyond the practical difficulties of propagandizing an entire nation on a subject as emotionally weighted and as personal and impervious to public inspection as their food habits. The other principal difficulties lay in (1) our method of teaching children to eat "good" food by rewarding them with nutritionally incorrect food—particularly an excess of sweets of all sorts—and so laying for each generation the basis for a rebellious attitude in adolescents and men against the moral nutrition recommendations of mothers and wives, and (2) teaching people to think, in more abstract terms, that certain foods are necessary, without teaching them why, and so providing no basis for flexible and intelligent change.

The first difficulty, our method of teaching children about food choices, is rooted in an old puritan attitude which defined virtue as pleasure following pain, and only tolerates enjoyment at a price. So upon this old moral attitude, the gradually developing knowledge of nutrition was grafted. Whereas in the past Johnny had to eat up his potatoes and vegetables just because he did not like them, now he has to eat them because they are good for him. This method of child training is not only an imperfect mechanism for the permanent incorporation into our social practices of sound nutrition, because each generation has to begin all over again—instead, as in the practices of sanitation and hygiene, beginning with the best knowledge of the present moment—but it is also incompatible with democratic practices. The kind of character which learns to eat its spinach, which it hates, to get its dessert, which it knows is bad for it, but which authority reluctantly concedes as a reward for virtuous behavior, is not the stuff of which vigorous democracy is made. Nor, because eating the wrong food has never been regarded as very sinful, is it the kind of behavior upon which good nutrition is based. Experiments¹ have shown that where individuals are allowed to make a choice rather than lectured and exhorted into good behavior, it is much easier to change their food habits.

The second difficulty of merely attempting to establish a balanced set of foods as current and approved practice is revealed very

¹ Lewin, Professor Kurt—"The Relative Effectiveness of a Lecture Method and a Method of Group Decision for Changing Food Habits"—Committee on Food Habits, National Research Council, 2101 Constitution Avenue, Washington, D. C.

sharply under war conditions. In England, where people had learned that their children needed fruit but did not know what fruit contained that made it specially important for children, the government had great difficulty teaching that the same nutrients could be obtained from green vegetables. Studies of attitudes towards shortages reveal that many people think of vegetables as a substitute for meat—because both are good for you and both are bulky and can form a sort of center to a meal. Similarly casserole dishes loom large in people's minds, certainly not because of the nutrients which they contain, but because they make a main dish. But many possible substitutions, and alternative sources of protein, such as whole grains and legumes, are almost unknown. When we furthermore consider the variety of regional and socio-economic eating habits which are obtained, both in war and in peace, it becomes apparent that to produce permanent changes in our national dietary pattern, it will be necessary to change our methods of bringing up children, on the one hand, and it will increase the public's understanding of the bases of nutrition on the other.

The objections to widespread education in terms of nutrients have various sources, those who fear that pills will be substituted for food, those who fear the results of letting an esoteric science become vulgarized by popular handling, those who underestimate the capacity of the average man to deal with words of three syllables, and those who fear that instruction in nutrients will assume the same moralistic tone that instruction in foods has taken in the past.

But a glance at the other measures which will be necessary to guarantee good nutrition to the whole country, will be sufficient to show the necessity of increased public understanding. As long as our present economy persists subsidies will be necessary to safeguard the nutrition of our lower income groups, if only in sheerly self-interested terms of having strong people for the army, the farms and industry. Oranges can be fought as luxury by ill-informed legislators, but Vitamin C can be presented in engineering terms as a necessity. Similarly the type of food and drug regulations which are necessary to safeguard the public against over-purified foods can only be carried through with an informed public opinion behind them—public opinion to which concepts like fortification and enrichment are meaningful.

Seen historically, the problem of changing food habits was originally viewed as an ethical one. As psychology developed, attention was shifted to devices by which "good habits" as opposed to "bad habits" could be inculcated in the individual child. The plate with the picture on the bottom, offered as incentive permission to turn the well scraped plate upside down, belong to this period in which simple psychological tricks were recommended and commercialized. Growing recognition of the idiosyncrasies of different children's bodily needs combined with evidence from mental hygiene of the lifelong ill effects which might result from forcing a child to eat some food which he temporarily rejected, have since introduced

in pediatrics and nursery school education admonitions to study the individual child and not force upon him standard practices which he for some personal reason rejects. Finally, studies of psychosomatic medicine have shown how deeply struggles over food may become involved in the etiology of diseases like asthma. The history of our historical attitudes toward the food habit formation of the individual child has thus been a continuous development away from the insistence upon a single standard of food practice, first in ethical terms, then in ethical terms reinforced by psychologically dictated tricks, toward an increasing attention to the special bodily needs and emotional attitudes of the individual child. In practice this has meant an increasing flexibility toward the actual foods chosen.

Social Side of the Problem

On the social side the problem has been seen first as a sheerly economic one—give people enough money and they will buy the right food. Studies made by the Bureau of Labor Statistics and the Bureau of Home Economics, which show better nutrition as income rises still support the contention that the basic nutritional problem is a proper distribution of food purchasing power. The shift to an interest in dietary patterns, reinforced by observations on the malnutrition found in the children of the rich, and on the intractability of the food habits of certain sections of the country like the south, may be fairly regarded as a compensatory move based upon a failure to solve the economic problem. But in wartime, when to inadequacy of purchasing power for large sections of the population is added shortages and failures in transportation, the problem of altering the national dietary patterns to maintain good nutrition under wartime scarcities, becomes increasingly pressing. Cultural engineering, in which traditional practices and deeply rooted cultural attitudes are taken into account, in any program to substitute vegetables for fruit, or soy meal for meat, or margarine for butter, become vitally necessary.

By viewing the whole problem anthropologically, past and present attitudes and practices, regional, socio-economic and national background differences, inter-relationships between food habits, and parent and child relationships, recreation patterns, work habits, etc., can all be taken into account. From an economic angle, if a worker is paid as much on a night shift as on a day shift, there is no reason why he should not be as well fed. But, investigations show that he eats the same number of meals as a worker on a day shift, but that he eats less often, a meal called "breakfast" and because breakfast traditionally includes orange juice, cereal, milk and eggs, the worker with the same wages and eating the same number of meals may be less well nourished. Increased income in a home, where the mother as well as the father is working, may mean poorer nutrition because the children are turned loose for the day with adequate funds but no guidance in how their money should be spent and often no restaurants which serve proper meals. The disappearance of some essential ingredient in food preparation,



Educational programs, to be the most effective, must alter our entire attitude toward food

like olive oil from the Italian diet, may mean that people on the same or a better income level will enormously decrease their intake of fresh vegetables, formerly eaten as salads.

In a country like the United States, under wartime conditions, with vast movements of population away from areas of familiar foods and food practices, with wartime shortages and the necessity for altering both cooking and eating habits, the solution seems to lie, not in attempts to introduce specific habits into the general population, but of altering their whole attitude toward food.

This can best be exemplified by the need for change in a housewife's buying practices. Housewives have been trained and encouraged to plan ahead, make out a week's meals in advance, buy in quantity, and balance each meal carefully. As they made out their lists, considerations of appropriateness for "breakfast, lunch and dinner" and social status "a steak for the night Mary brings her friend home", etc.—and considerations of price—lamb stew for two nights to make up for the steak—presided over their deliberations. Now, to the extent that a housewife attempts to plan in this way, thinking in terms of specific foods and specific prices, her choices are guided also by considerations of when a "roast" or a "steak" are appropriate, she is condemned to standing in line, hours of fruitless shopping, and gets only partial fulfillment of her plans, which may actually result in very sadly balanced meals and imperfect nutrition for her household. At the same time, on her basic ration buying she will have to think ahead. Only by scrapping as many of her preconceived ideas as possible, and keeping in mind, not specific foods, but food groups, and if possible food elements, can she shop quickly and efficiently, responding to the foods that

are available flexibly rather than following fixed habits which are no longer relevant.

What is needed, in fact, is not a change in food habits, but a change in habits of thinking about food—a loosening up of the old rigidities which regard meal plans as set so that what is food for breakfast is not food for dinner, or so that fruit and vegetables can not be substituted for each other,—and an increased recognition of the importance of nutritional balance.

Restaurants and institutions forced by wartime conditions to alter drastically their menus, could lead in attempting to maintain by informing their patrons that they are maintaining balanced meals by specific devices. Inspired newspaper articles, radio talks and officially furnished recipes can all be used to develop a more flexible engineering approach to the problem of food. Information about the way in which Great Britain has solved her food problems, about the quest for Vitamin C which ends in rose hip syrup and black currant puree for babies, can be used to alter the whole approach to the wartime food situation from one of unwilling abstinence and deprivation to one of positive and effective utilization of available supplies. Victory gardens can be used not only as a local source of high vitamin vegetables, the supply of which will be endangered more and more by transportation shortages, but also as a method of educating school children and the general public in the role which food elements play in growth and health.

Properly handled, our food experiences over the next few years can be used to lay the basis for an immensely improved, flexible and democratic dietary pattern. The National Nutrition Campaign has laid the foundation of public interest in the idea of nutrition; wartime shortages will force public attention upon solving food problems, the food problems of the various European countries will serve as examples of food engineering. The experience of millions of men in the army, and other millions who have migrated to other parts of the United States and who before the war is over will be eating in nutritionally adequate factory canteens, will also serve to break down established rigidities and increase receptivity to new foods, new food combinations, new methods of preparing foods. If all of these experiences are conserved by a continuous process of public education which emphasizes the power which the science of nutrition has given us to use in our food supplies with maximum efficiency, then the American people may emerge from the war, not with better habits of eating spinach, but with something much more important, a new habit of mind about food—a habit of mind which demands balanced meals, which demands that food should not only satisfy the eye and the palate, and satiate hunger, but should also be as nourishing as the existing state of scientific knowledge can make it.

What They Are Eating "Over There"

By John Lindberg

Economic, Financial and Transit Department of the League of Nations

Americans will have better diets, even under war-time restrictions, than Europeans. In fact, in 1943, we will consume even more calories per capita than Europeans did in peacetime.

THOUGH the war prevents full reports from reaching us of conditions in Europe, sufficient material on rationing is seeping through to permit rough appraisals of nutritional standards in the principal countries. It should be remembered, however, that rations do not necessarily correspond to consumption for, often, particularly in the German occupied areas, full legal rations may not be obtainable; rations are also supplemented by contributions from the black market. No accurate estimates of the importance of these factors are possible at the present time; but by and large, it may be assumed that the figures based on rations are maximum, rather than minimum estimates.

International comparability of data depends also on the character of the rationing systems, which have tended to become more and more differentiated, allowing different rations, not only to persons in the armed forces and farmers, but also to different consumer categories according to age, sex, occupation, etc. The concept of a "normal" consumer has become more and more an empty administrative concept, and rations of the "normal consumer" do not permit accurate calculations of actual consumption.

For this reason, the League of Nations has introduced a method of increasing international comparability of rationing data by using as yard stick, not any one individual but a typical (though hypothetical) worker's family composed of husband, wife and three children aged 3, 6 and 9, representing the organic unit of consumption. Absolute results would differ were the composition of the family modified, but the international comparability of the results is not likely to be greatly affected. The consumption of the family is expressed in terms of the consumption unit (the "adult male"), each family member being counted as a fraction of the unit). The results below, while indicative of the nutritional levels of typical working class families, should not be taken to represent average national consumption.

Levels of Consumption

The primary requirement in diets is that they should prevent starvation; that is, they should contain enough energy to maintain the calorie equilibrium of the body. Though all important foods—

excepting sugar—contain both energy values and other nutritive elements, and a strict separation between energy foods and “protective foods” is not possible, it is nevertheless useful to make a distinction between the staple foods—chiefly cereals and potatoes—and other foods chiefly animal foods, fruits and vegetables. The staple foods, being the cheapest source of energy, supply the bulk of the body's energy requirements, and the question of the sufficiency of calorie intake is in wartime more than ever decided by the availability of the staple foods.

With this distinction in mind, one may now distinguish between total and partial rationing. The former includes all important foods; the latter as a rule excludes one or more of the staple foods—cereal, bread and potatoes.

Partial rationing is now in force in Great Britain, Sweden and Switzerland. In Great Britain, bread and potatoes are free, in Sweden milk and potatoes, in Switzerland potatoes. Each individual, therefore, can (provided he has the purchasing power) acquire the amount of calories he needs, and the risk of starvation is thereby theoretically excluded. Such estimates as are available point to a calorie intake in these countries up to or even above the 3000 a day per consumption unit which is generally accepted as a physiologically desirable level—indeed in Great Britain it appears that the level is higher than during peacetime—reflecting, no doubt at least partially, the higher requirements resulting from the intensive wartime employment and activity. It is interesting to note that consumption of the free commodities has increased, compensating more or less for the loss in calories from other sources. In Great Britain bread consumption even a year ago was up by 20%; in Sweden milk consumption is up by 16% and potatoes by 26%; the bread ration in Switzerland is some 30% higher than consumption before the war.

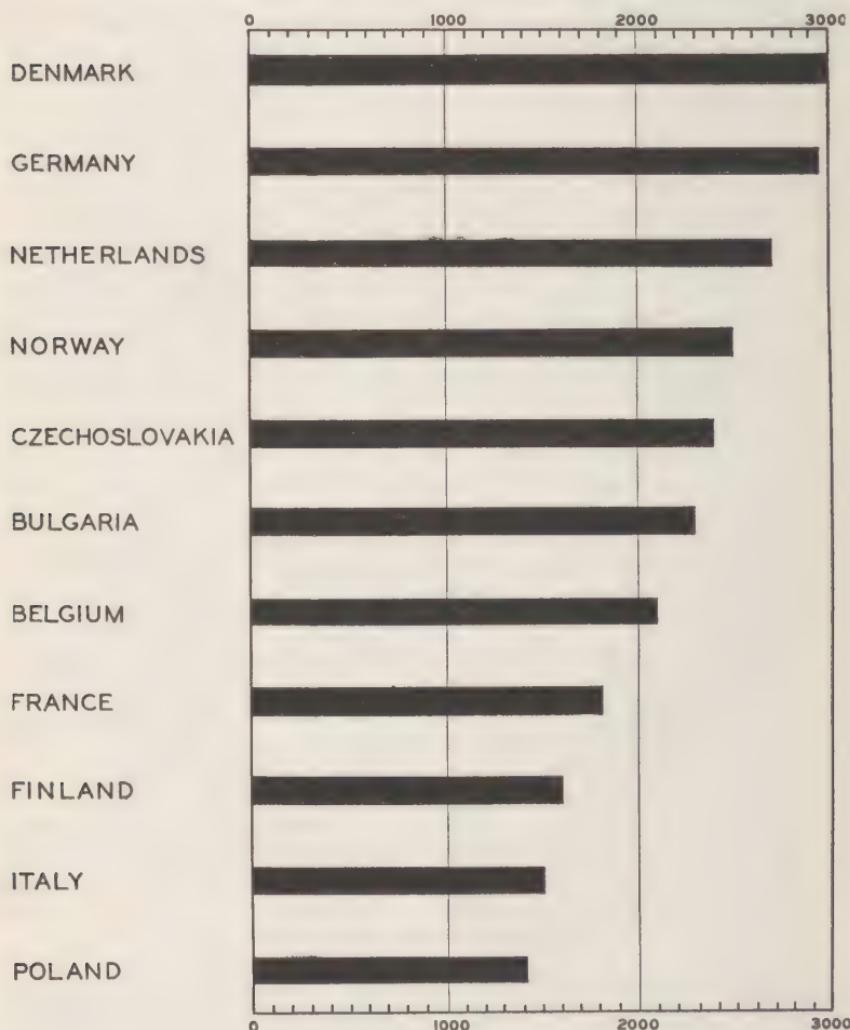
In countries imposing total rationing—practically the whole of German-dominated Europe, Italy and Spain—the system does not permit of corresponding individual variation in calorie intake, and the consumption levels are almost 100 per cent decided by the rations. The League of Nations has calculated, on the basis of rations during the autumn of 1942, the average daily number of calories per consumption unit for families, the head of which is a “normal consumer”. The results are given below:

Denmark	3000	Belgium	2100
Germany	2950	France	1800
Netherlands	2700	Finland	1600
Norway	2500	Italy	1500
Czecho-Slovakia	2400	Poland	1400
Bulgaria	2300		

In considering these figures it should be recalled that calorie requirements differ with climate, average stature, and occupation. Requirements are lower in Southern Europe than in Northern and Western Europe; the enforced idleness of workers in occupied

areas also reduces requirements. Even in peacetime, consumption fell below requirements in many European countries. Nevertheless, the figures illustrate greatly differing conditions. Calorie intake is nominally up to standard in Germany and Denmark. In the Netherlands, Norway and Czecho-Slovakia, intake is below peacetime standards by perhaps some 20 per cent, but nominally the rations are not critically short, though real consumption is frequently apt to be lower owing to non-availability of rationed foods. In Belgium, France, Finland and Italy, to which group one may add Spain, serious deficiencies appear; not only is the con-

Average Daily Number of Calories per Consumption Unit for families, the head of which is a "normal consumer"



sumption far below (sometimes as much as 50 per cent or more) peacetime consumption, but also below any accepted nutritional standards. In parts of Poland, Yugoslavia, occupied Russia and Greece, conditions are even worse than indicated by the figures quoted above, and must be characterized as outright famine.¹

Composition of diets

So much for the general level of consumption. Not less important is the question of the composition of diets with respect to fats, proteins, minerals, and vitamins.

Fats, the most concentrated source of energy, were contained in prewar budgets in varying amounts. It is generally recognized that a drastic decrease in fat-intake leads to digestive disturbances and the phenomenon of "hidden hunger". The decrease in fats, which is perhaps the most generally rationed of all foods, is a serious matter. It would appear that rations are roughly sufficient in Denmark, Sweden, United Kingdom, Switzerland and perhaps Germany, though in the last country certainly too low for comfort. Rations in the occupied areas generally fall with the reduction in the general calorie level, and are obviously insufficient even in proportion to the low general intake in most of these countries.

Proteins—the chief body building constituents in the diet—are obtained from both vegetable and mineral sources. Though it is desirable that a part of the proteins should be of animal origin, populations can and do subsist on almost exclusively vegetable diets. Where the diet contains whole bread and cereals, peas, beans, etc., there is generally little danger of over-all shortages of proteins—at least as far as minimum (as opposed to optimum) requirements are concerned. In countries where potatoes (as in certain parts of Eastern Europe) are largely substituted for bread, serious deficiencies are likely to develop. The situation with respect to animal proteins—important for optimum health and resistance to illness—is critical. It still appears relatively satisfactory (though perhaps below desirable optimum levels) in Denmark, Sweden, Switzerland and the United Kingdom. In all Continental Europe, consumption is far below prewar standards, and in the low consumption areas, meat, eggs and cheese have practically disappeared; whole milk when available is reserved for children.

Mineral deficiencies apparently follow the pattern of other deficiencies. Lack of dietary calcium and phosphorous have developed where milk and cheese consumption has been seriously impaired, as the decrease has not been generally compensated for

¹ As stated above heavy workers and others receive extra rations increasing average of national consumption. Intake per consumption unit of a family where the husband is away from home is some 10-20 per cent higher; of families the head of which is a "heavy worker" some 5-10 per cent higher; and of "very heavy workers" families some 10-20 per cent higher. At an average this factor could increase national consumption by a few per cent only.

by increased intake of green vegetables. With regard to vitamins, the situation would not appear to be much more unsatisfactory than before the war in the United Kingdom, Sweden, Denmark and Switzerland. In Germany diets appear short in particular of vitamins A and D, and shortages are proportionately more serious in the occupied areas.

A more detailed study than has been possible here confirms the general conclusion that the deterioration in the quality of the diet is closely connected with the decrease in quantity. This finding is supported by considerations of agricultural economics. When total supplies become short, production is concentrated on the high calorie yielding foods—cereals, potatoes and sugar—at the expense of the lower calorie yielding foods of higher nutritional value—milk and milk products, eggs, meat and fruits.

In conclusion it may be useful to consider the American food situation in the light of the European experience. According to a recent estimate by the United States Secretary of Agriculture, the food available in 1943 represents an energy value of 3000 calories per day per head of the population, or about 4500 calories per consumption unit. The latter figure is not strictly comparable to the figures above, which are based on actual purchases, for it includes waste in distribution, etc. Even if the figure is reduced by 10-20 per cent to allow for these factors, it is still higher than any figure for Europe—indeed higher than any known peacetime figure even in countries like Sweden which had the highest and nutritionally best composed diet in Europe. The proposed meat ration, 1120 grams per week per head, is more than double that of the British rations and probably—if account is taken of the lower children's ration in Britain and the large number of unrationed items in the United States—as much as three times higher. The sugar ration, on the other hand, is about as high as in most European countries, but it is supplemented in the United States by free jam, preserves, etc., bringing total consumption above any war time level in Europe.

Differentiation of Rations

Whenever rationing includes a considerable proportion of foods, the question of differential distribution assumes significance in proportion to the scarcity of the total food supplies available.

The nutritional requirements of individuals differ according to sex, age, occupation and many other circumstances; as a point of fact, no two individuals are likely to have exactly the same requirements. In order, therefore, to lessen injustices on the one hand and to prevent the fixing of rations on a wastefully high level on the other hand—thus defeating its purpose of economizing existing resources—some method must be found to meet variations in needs. Equal *per capita* rations are possible only as long as a few relatively unimportant foods, like sugar, are subject to ration. Indeed the problem of differentiation is central in rationing and

sound nutrition alike and a prerequisite of laying the spectre of all rationers—the black market.

Two main systems have developed—the German and the British.

The German system is applied over practically the whole of the Continent of Europe. It divides the population into a number of consumer categories. A study of the rations shows that women and children receive more calories, in terms of requirements, than do men who are normal consumers. The diets of children are also relatively richer in protein and other protective elements, particularly because of the allocation of available milk supplies to children, expectant and nursing mothers. "Heavy" and "very heavy" workers require additional amounts of energy foods. Extra rations are granted of bread, cereals, fats and meat. The "normal" rations of these foods in Germany contain some 1200 calories, those of "heavy workers" 1900 and those of "very heavy workers" 2650; similar differences are found in other German dominated countries.

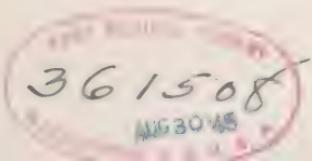
The German system of differentiation becomes clearly discriminatory in respect to areas and races under their domination. Differences in rations are not proportionate to needs, but are designed to concentrate shortages in supplies in certain areas in order to maintain consumption in Germany proper. Though this is a glaring example of the misuse of rationing power, it should not be overlooked that all total rationing schemes—operating under over-all scarcities—are up to a point discriminatory. These irregularities—in terms of need—can be mitigated but not wholly eliminated by differentiation; for practical reasons differentiation cannot be carried as far as to allow for differences in individual needs.

The British system operates on another basis. The difference is largely possible because of a more favorable over-all supply situation, making it possible to maintain partial as opposed to total rationing. Shortages relate—as in the United States—to special foods and not to the food supply as a whole.

The British basic rations cover meat, fats, sugar and cheese—that is (with the exception of sugar) animal foods and fats. As bread and potatoes are free each individual can obtain exactly the number of calories he or she needs. The basic rations are intended to cover the "average need of the average family". The British system, therefore, has maintained flexibility in the consumption of energy foods; as the need for energy fluctuates more widely than the need for protective foods, a major need for differentiation is eliminated and left to the operation of the free market mechanism.

Nutritionally, however, various categories of the population have requirements of animal and protective foods which often differ considerably from the average. These groups are granted needed additions by means of special distribution schemes outside the scope of individual rationing. These schemes may be briefly summarized under the following headings:

(1) **Restaurant, canteen feeding, etc.** School lunches were inaugurated before the war, but they have been greatly extended.



To care for workers and cater, elastically, to various occupational needs, factory canteens are set up, the aim being "to assure that workers should take at least one full meal in the day at their work." In addition "British Restaurants" cater to special areas and needs supplementing the services of the ordinary restaurants, which, too, serve coupon-free meals. The number of coupon-free meals served weekly in the summer of 1942 amounted to 135 millions, of which 43 millions were in industrial canteens and 2 millions in British Restaurants. The composition of the canteen meals has gradually been improved. Canteens and catering establishments are divided into groups according to whether they serve (a) heavy workers, (b) other workers or (c) the rest of the population. The first group is entitled for each meal to twice as much meat and three times as much sugar as the third, and the second group to half as much meat and twice as much sugar.

(2) **Distribution schemes.** The most valuable protective foods—milk, eggs and some fruits—are covered by these schemes. The object is primarily to supply the special nutritional needs of children, expectant and nursing mothers, sick people and invalids. Ordinary consumers receive no fixed rations but only what remains after priority groups have received their full quota.

(3) **Point or group rationing.** This system—though generally applied in clothes rationing—is not as yet of great practical significance as regards food. It is nevertheless an interesting departure in rationing technique, designed to mitigate the rigidity of the specific rationing. It has the further advantage of permitting the rationing of goods, the supply of which, taken by itself, is too small or erratic to permit regular rationing. Each consumer receives a number of points which are given value in respect to specified goods—at present tinned meat, beans and fish. These are desirable—though not essential—additions to the diet, and through the double mechanism of point and price changes demand can be steered in the desired direction.

To sum up: though a cursory examination of the specific rations would give the impression that the German rationing system is more differentiated than the British, a study of food distribution as a whole shows the opposite to be true. The German system, owing to its total character, is rigid and inflexible, regulating total consumption in a summary fashion. The British system does not purport to limit total consumption, which is guided by individual demand for unrationed goods serving as budget regulators; it aims at supplying the whole of the population with the elements of sound nutrition.

Rationing and Income

Rationing tends to equalize food consumption. It is obvious, however, that the poorer income groups should also have the money to buy the quantities to which they are legally entitled. Otherwise it is practically impossible to prevent the rise of black markets and illegal trade.

A first prerequisite to a really equitable rationing, therefore, is price-control. In many countries, particularly in Italy and the occupied areas, prices have risen faster than wages, and it is reported that large sections are unable to utilize fully their meager allowance of coupons. Even in countries like the United Kingdom, however, where price controls have been applied with considerable success, additional measures have become necessary to aid the lowest income groups. In this country, the free school lunches, the national milk scheme, and the distribution of fruit juice supply, the poor with their quota of the essential foods at a reduced price or, in case of need, free of charge. The most significant contribution of the Government, however, is in the form of subsidies to food production. The Ministry of Food has virtual monopoly powers over all imported and most home-produced foods. It can and does fix prices largely according to considerations of social policy; the difference between the cost and selling price is carried by the Treasury and profits earned on the sale of less essential foods. In 1941-42 subsidies (including subsidies for sea transport) amounted to about 130 millions. Similar policies are adopted in other countries. Sweden, in addition to direct subsidies, has continued its food stamp plan, giving special rebates to the lowest income groups on the purchase of milk, fats and butter.

Conclusions

Food rationing as it has developed during the present war in Europe is an integral part of war economy. It operates smoothly only when coordinated with the general control of production, supplies, and income. Where it has been most successful, it has retained a degree of flexibility in food habits and has been more than a method of restricting individual consumption, aiming, in fact, at securing wholesome minimum diets for the population as a whole.

British Wartime Nutrition Policy

By Edith Denhardt

Special Assistant to the United States Ambassador to Great Britain

An expert observer tells us that England's experience indicates that food and nutrition policies must be coordinated, prices of food must be kept within reach of low-income groups, workers may have to be given special food priorities, and communal feeding centers are valuable nutritional aids.

FOR more than three years the economic resources of Great Britain have been steadily diverted into production for war. Nearly two-thirds of the entire population between the ages of 14 and 65 are working full-time in industry, the armed forces or civil defense.



The Women's Voluntary Service (WVS) prepares hot tea and buns for workmen clearing away debris of buildings hit by Nazi bombers



Edna Herbert, 19, British factory worker enjoys her mid-day meal at one of many canteens set up by government regulation

Not until well into 1942 did the United States with considerably more than double the working population of the United Kingdom begin to produce more armaments than the United Kingdom. Even today the per capita production of war goods in the United Kingdom is greater than that of the United States. In addition the demands on shipping space for war goods have necessitated a drastic reduction in food imports.

In spite of this tremendous diversion of resources to the needs of war, the nutritional condition of the British people has not been seriously affected and has even improved in several important respects. The effect of this upon morale and even on war production cannot be measured but it must not be underestimated. Such an extraordinary achievement could not have been accomplished if Britain had not adopted, not only a food policy, but also a nutrition policy, very early in the war.

The capacity to learn from the experience of others is the beginning of wisdom and the successes and failures of Britain's food and nutrition policy deserve careful study in America. It is true that many of the problems in the United States are very different from those in Great Britain and some of them are immensely more difficult. Nevertheless, the needs of the people are the same, the economic principles are the same and many of the techniques developed in Britain are equally valid for nutrition policy in the United States.

Because of the special importance of food for human welfare, Great Britain set up a Ministry of Food immediately on the outbreak of war, thus adopting the principle, which has not been adopted in the United States, of treating the control of food supplies and distribution separately from the control of other sectors

of the civilian economy. The existence of a separate Ministry of Food has made it easier for the country to adopt and make effective an integrated food and nutrition policy.

It is possible for a country to have a food policy without having a nutrition policy. That is to say, food policy can be viewed as an economic problem of prices, production and distribution without emphasis on the nutritional needs of the people or the special needs of certain groups. In this case, prices are controlled to keep down the cost of living and thus forestall wage demands and the "vicious spiral" of inflation. Foods in short supply are rationed to prevent queues and to assist the control of prices, and distribution is controlled to prevent unnecessary use of labor and transport and to facilitate price control. This is not a nutrition policy; although the needs of consumers cannot be ignored, the emphasis is on the economic rather than the nutritional aspects of food policy.

The existence of a separate Ministry of Food has, I think, been to a considerable extent responsible for the fact that Britain has a positive nutrition policy closely linked with the economic aspects of her food policy. The same agency that controls food prices and distribution and administers rationing and communal feeding, also conducts nutritional experimentation, causes surveys to be made of the nutritional condition of the people, issues recipes to housewives, conducts nutritional propaganda and employs biochemists to advise it on the values of different foods and the problems of wartime nutrition generally. The coordination of food and nutrition policy is consequently extremely close.

The ultimate aim of a country's nutrition policy should be to insure that every individual in the community has a diet as nearly adequate for his needs as is possible under the circumstances. This has not, of course, been achieved anywhere, but in Great Britain the goal is actually closer now than it was in peacetime. Because of the pressing demands on manpower, raw materials and transport for the war industries, a wartime nutrition policy should not only raise the standard of the worse fed section of the population but should also be concerned with reducing the unnecessary consumption of the better fed sections of the population in order to release resources for war production. Price control, quality control, rationing and priority distribution, communal feeding and education are the most important tools in the fashioning of a wartime nutrition program.

Price Control

During this war food prices have risen in all industrial countries partly because of the increased costs of production and importation but also because of the increased demand resulting from the higher level of employment and money earnings. Food prices should not, however, be allowed to rise very far above the pre-war level because food is such an important component in the cost of living that a rise in food prices invariably results in demands for higher wages and especially because the food consumption of the lower

income groups quickly suffers when prices rise. There are thus two aspects of food price policy: the prevention of excessive increases in prices resulting from the relative shortage of supplies and the prevention of excessive increases resulting from increased costs.

Neither can be accomplished by the simple procedure of setting maximum prices and declaring illegal and subject to penalties the sale of foods above these prices. If demand is much greater than supply the result is simply a mad rush on the part of consumers, queues, individual injustices and, inevitably, widespread evasion. If costs are rising and prices are fixed distributors must either go out of business or evade the price regulations. Even if prices could be kept down when a severe shortage existed, without controlling either demand or supply, the workers of the country would suffer most because they have the most difficulty finding plenty of time for shopping. Inequality of shopping opportunity as much as inequality of income must be considered in forming a food policy.

There are only two methods by which a shortage of supplies relative to demand can be handled—increasing supplies or decreasing demand. Britain has not been able to maintain supplies of all foods sufficient to meet all demands at a reasonable price. Under these circumstances prices would have risen to a point where demand and supply became more nearly equal but severe general suffering and serious discontent among the lower income groups would have resulted. To avoid this Britain has controlled prices. This price control has been extremely effective because *both* demand and supply have been controlled. In almost all cases price control has been preceded by control over supplies and the channels of distribution. In the few cases where supplies were not controlled before maximum retail prices were imposed and where a serious shortage existed, there was widespread evasion and enforcement was almost impossible.

The importance of control over supplies and distribution cannot be underestimated. Producers and distributors cannot be left free to compete if a maximum price is to be held. The control over food supplies is easier in Britain than it is in the United States because such a large proportion of Britain's food is imported directly by the Ministry of Food. Control over home grown food is effected either by creating or taking over a "bottleneck" through which all supplies are required to pass—for example the slaughter houses, the Milk Marketing Board, the egg packing stations and the flour mills—or by licensing first-hand sellers and distributors. It is essential that at some point the Ministry of Food shall have control of supplies so that it can direct distribution and control prices.

Subsidies: If, however, costs are rising, prices can be prevented from rising to cover costs only with the help of subsidies. In Great Britain most of the food subsidies are in the form of trading losses of the Ministry of Food—the Ministry buys the foods it wishes to subsidize and sells them at a lower price than it pays for them. At present the Ministry of Food subsidizes food prices at the rate of nearly \$600 million a year. The largest subsidies are for cereals,

meat, potatoes, and milk, but sugar, eggs, tea, milk products, bacon, ham, carrots and various small items are also subsidized. *There is no doubt that this generous subsidization policy has been largely responsible for the effective stabilization of the cost of living and has saved the country several times the amount spent in subsidies.*

In addition, milk for all pregnant and nursing mothers and for children under five irrespective of income is sold at reduced prices or if the family income is below a specified minimum is given free. This "free and cheap milk scheme", as it is called, is an important advance in social welfare since it, together with priority milk distribution which is discussed below, ensures that these groups in the population are able to obtain a specified quantity of milk irrespective of the family income. Cod liver oil, black currant juice and puree and orange juice are distributed free to young children through the maternity and child welfare clinics. In this way some of the special nutritional needs of children are directly met by government action.

In the United States distribution of such foods through child welfare clinics and subsidized distribution of milk could be done on a local or state basis. Such measures have a direct and speedy effect on the nutritional condition of children and mothers, who are, after all, most important for the nation's future.

Rationing and Priority Distribution

When serious shortages arise, individuals with the most money and the most time for shopping have the best opportunity to get the largest share of the small supply available. This clearly discriminates against the workers and the lower income groups. Furthermore, the pressure of effective demand makes price control extremely difficult to enforce. It is, therefore, necessary to control effective demand by requiring some authorization other than the possession of money for the purchase of those foods in short supply, i.e. a ration document.

Differences in the conditions of supply and demand in regard to different foods require different types of rationing. Three methods of rationing have been adopted in the United Kingdom, each fulfilling a specific purpose, and no one method can satisfactorily replace the other.

Formal and specific rations of single commodities are established for those foods which are "basic" in the people's diet either because of custom or because of their nutritional importance, and for which the possibilities of substitution are extremely limited. Most of the foods rationed in this manner are not only "basic" in a very real sense but are in regular supply, not excessively perishable (with the exception of meat) and are regularly consumed by practically everyone, so that demand is predicted with less difficulty than it could be for foods that large numbers of people do not eat.

A more elastic rationing system has been evolved for milk, eggs, onions and oranges, for which consumers register (except for oranges) and receive allocations against their registrations. This

elastic method was adopted for milk chiefly because of its perishability and fluctuating supply; for eggs because of their extreme scarcity and fluctuating supply; for onions because of unequal demand, seasonality, scarcity and perishability; and for oranges because of the desire to reserve them for children and because of their scarcity and perishability. Thus for different reasons each of these foods is unsuited for a formal specific ration but they all have certain characteristics in common on the supply side and they are all more perishable than any food on the points scheme.

“Points” Rationing: The third method of rationing—by points—was adopted to meet an entirely different situation. It is called the “points rationing scheme”, and its purpose is to make available a fair share to all consumers of a number of foods which could not easily be rationed separately, not only because of differences in taste on the demand side, but also because of the tremendous administrative machinery and additional red tape that would be required. To each consumer are issued three types of coupons, each worth a specified number of points. Each rationed food is declared to be “worth” a certain number of points per pound or per unit, and consumers are allowed freedom to choose the foods on which they will “spend” their points. All the foods under points, such as canned meat, fish, milk, fruits and vegetables, certain cereals and cereal breakfast foods and dried fruits, are in short supply but none of them is basic in the same sense as the foods rationed under the first method discussed. All of these foods can be classified in groups within each of which a high degree of substitutability exists both from the point of view of taste and of nutrition. The demand for any particular food in the points ration varies greatly as between different individuals: Some people like canned salmon and not pilchards, beef and not pork; others never eat rice; and many people do not like condensed milk. This unequal demand is the chief reason for adopting a rationing system allowing considerable latitude of choice to consumers. It is clear that the chief characteristic of the foods in this ration are markedly different from those of the foods rationed under the two other systems.

The rationing of specified quantities of certain foods ensures that everyone has a chance to buy this quantity if prices are subsidized and controlled at levels within the reach of all. It is frequently alleged that points rationing gives greater freedom of choice to the consumer and results in an increased amount of consumer “satisfaction” which is held to be a net gain. However, there are objections even in normal times to the theory that maximum “satisfaction” resulting from freedom of choice must in all cases take precedence over maximum physical wellbeing from an objective point of view, and in wartime the objections gain even greater force. It is well known that individuals frequently do not want what they should want and nowhere is this more important than in food consumption.

The efficiency of the war effort is affected by the physical efficiency of the people. When the variety and amount of food

available is diminished, malnutrition is likely to result more quickly from a wrong selection of food. While it is agreed that people should not be forced to eat what they do not want, there are strong arguments in favor of adopting a distribution mechanism that will influence people to make a more balanced and nutritionally sound choice of foods. A rationing system which makes available a minimum amount of the more important foods to everyone is more likely to influence people to buy these foods than would a "free choice" system of distribution. In the latter case, moreover, those with the best developed knowledge of food values and the most advanced food habits would demand more of the nutritionally important foods and would have the least elastic demands for them. It would, therefore, be more difficult for others to obtain these foods, and since their demand is less "informed" they would go without more easily. Consequently, free choice has an effect opposite to that of rationing on the food consumption habits of the population.

The points rationing system for all foods would probably result in the points value of the more nutritionally desirable foods being bid up by those with the most informed demand and if the ration included cheese, milk, meat and fats the effect on the average person's diet could be harmful. If a reasonably adequate diet is to be ensured at all, a minimum amount of certain foods must be consumed and the most effective way of promoting this end is to set aside at least this minimum for each person. On nutritional grounds it is undesirable that less than the present rations of fats, meat and cheese be consumed by anyone and the supply position makes it undesirable that more sugar or tea be consumed. The specific ration encourages the minimum consumption of the first foods and prevents a greater consumption of the latter.

In the administration of rationing, Great Britain has not tried to differentiate between different classes of workers according to whether their work is light, medium or heavy. In this it is acting in accordance with the advice of the Trades Union Congress. The difficulties of classification and the necessary discrimination that it would involve plus the fact that bread and potatoes,—two of the chief sources of energy,—are cheap and in sufficient supply to make rationing unnecessary are largely responsible for the general policy of equal rations for all. There are, however, some exceptions. Workers who have few canteen facilities because of the nature of their work, e.g. agricultural workers, underground miners, county roadmen, certain classes of railway workers, etc., receive special cheese rations. Invalids and persons suffering from certain diseases and vegetarians also receive special rationing concessions.

Priority Distribution: One of the most outstanding nutrition measures adopted in Great Britain since the outbreak of war is the free and cheap milk scheme. Nursing and pregnant women and children under five have a priority right to one pint¹ of milk a day at 2d a pint (a little less than 4¢) and children under 12 months

¹ The British pint is $\frac{1}{5}$ larger than the American pint.

are allowed 2 pints a day. The milk is supplied free if the income of the parents falls below a specified level. Over 80% of the mothers and children entitled to milk under this scheme are getting it, nearly 30% of whom are getting free milk. The allowance of milk to ordinary consumers varies with the supply since they get what is left after the priority demands are met.

The price of eggs is also kept down by subsidy and allocations are made to consumers in accordance with the supply. For every egg received by ordinary consumers, the priority classes receive four. Thus, if a married couple received only two eggs in a month, a family with two children under six and another coming would receive 13 eggs.

Communal Feeding

As a result of the shortages of many important foods and the reduced possibilities for substitution, wartime nutrition policy must make greater use of price control, subsidies and rationing than a peacetime nutrition policy.¹ Nonetheless, such measures to assure the availability of important foods to all income groups do not cover the whole field. One of the most important aspects of food policy in Great Britain and one of direct relevance to the problems in the United States is the vast extension of communal feeding. Although Britain has adopted the general policy of equal rations for all it has used industrial and school canteens and British Restaurants to get extra food to certain groups of people.

Communal feeding takes four general forms: canteens in industry, at the docks and at the pits, school canteens, British Restaurants and emergency feeding centers. The general principle is to provide feeding facilities for people wherever they are congregated.

Industrial Canteens: This principle was adopted for factory workers early in the war and early in 1941 extra food allowances were granted to factory canteens. In 1940 a survey of catering facilities for industrial workers was carried out to discover where new canteens and special communal feeding centers were required. The Ministry of Food assists employers in setting up industrial canteens. Employers engaged on Government work who employ more than 250 people are required to establish canteens in their factories, at the docks, at building sites or where engineering work is being carried on. In addition the Ministry of Food can and does require smaller employers to set up canteens where special circumstances—e.g. isolation—make it desirable. Owners of mines and quarries may similarly be compelled to set up canteens.

The establishment of industrial canteens in large factories is a relatively easy problem once the cooperation of the employers has been secured. There are, however, large numbers of small plants in Great Britain in which it is not practicable to set up canteens. If there are several such plants in an area, arrangements are frequently made to set up British Restaurants to which workers may come for their meals or which will cook food and take it in bulk to

¹ Nevertheless, subsidies and methods of priority distribution can be widely used in peacetime to raise standards of food consumption.

the factory mess rooms. Pit head canteens and snack bars are set up for miners. If there are difficulties in providing canteens with cooking facilities in a reasonably short time, centers are set up for the distribution of previously prepared food. Such centers are given the rations allowed other industrial canteens with the exception of meat, which they are unable to cook. The meat is allocated to manufacturers who provide meat pies, sausage rolls and other meat preparations.

The Ministry is advised by an Advisory Committee of the Trades Union Congress in regard to industrial feeding. This Committee takes up the problems of special groups of workers and assists in establishing conditions of training and of work for the staff. It is desirable to associate workers committees with industrial nutrition policy and with the supervision and management of the canteens.

School Canteens: Another and equally important type of communal feeding that has been extended during the war is in the schools. The Board of Education with the cooperation of the Ministry of Food is pressing the Local Education Authorities to provide meals in every school either from a canteen maintained in the school itself or from nearby British Restaurants and cooking depots. The Ministry of Food has arranged that the cooking depots, each with a capacity to produce 3,000 mid-day meals daily, which have been set up by County Councils and Local Authorities, shall also be available to prepare and deliver meals to schools. The Board of Education pays a minimum of 70% and a maximum of 95% of the cost to the Local Authority of providing these meals. School canteens are registered as priority catering establishments and receive special allowances of some rationed foods and are assisted by the Ministry of Food in obtaining supplies of certain unrationed foods. The school meals are expected to furnish a well-balanced and adequate main meal for the children and the nutritional value of the meal is considered to be of greater importance than its cost. If parents are unable to pay the cost of a good meal "the remedy is not to give a poorer meal, but to adjust the income scales so as to provide meals for part payment, as well as free meals in cases of greater necessity."¹ The Board of Education issues circulars to the local authorities regarding the nutritional standards that should be met in the school meals and the foods that should be used; problems of management, administration and supply are also discussed.

In some areas attempts are made to find out what the children think of the school meals. One of the commonest complaints, especially among adolescent boys, is the insufficiency of the school meal. Adolescent children need a larger number of calories per pound of body weight than do normally active adults and in planning a school meal program the special needs of the adolescent should be the basis of the diet given.

¹ Board of Education circular 1571, 12 November, 1941.

British Restaurants: The program for establishing special communal feeding centers on a non-profit basis arose originally as an emergency program but rapidly developed into a permanent part of the war organization. The value of such centers has been so conclusively demonstrated that there is a widespread opinion that they should be maintained in peacetime.

The term *British Restaurant*¹ has been widely adopted for those communal feeding centers which are non-profit restaurants set up by the public authorities and run by managers hired by them. The responsibility for setting up these restaurants rests primarily with the local authorities but the Ministry of Food must approve the project and will finance construction and cover any losses incurred by the authorities on running expenses. British Restaurants are set up primarily to serve workers in areas where regular catering facilities are inadequate. Dance halls, shop premises, church halls, town halls and closed down restaurants are converted into British Restaurants.

British Restaurants are used by all groups in the population and every effort is made to achieve bright and cheerful surroundings. Paintings are lent by art galleries and artists, and murals are commissioned. There is no suggestion of a bread line in these restaurants and they are consequently very popular and always crowded. A meal consisting of soup, meat, potatoes, vegetable, dessert and coffee can be obtained for approximately the equivalent of 25c and the cooking is, for the most part, extremely good and done with an eye to the nutritional values of the food. Most restaurants, especially in the smaller towns, in addition to their restaurant service run a "cash and carry" service, where a housewife can come with her dishes and collect ready-cooked and hot food to take home to her family.

The Ministry of Food maintains a staff of catering officers whose job is to inspect the efficiency of the service given by British Restaurants throughout the country. There are various divisions and sections within the Ministry of Food which are concerned with issuing leaflets on management and organization, supplying information about food supplies, instruction about nutrition and suggesting menus for British Restaurant managers. Ministry of Food inspectors make investigations into the nutritional content of meals and give advice on improving it. Nutritional Surveys are also made of factory meals and advice is given by representatives of the Ministry to the canteen managers. The Ministry has not encouraged the use of vitamin preparations in factories and among the people because it believes that a well-balanced natural diet is in general a better basis for its nutrition policy. Vitamins A and D are added to margarine, however, and margarine now contains more vitamin D than does butter.

¹ Many other terms are in use in local areas. For example, London has its own restaurants, which are called *The Londoners Meals Service*; one smaller town calls its restaurants *Civic Cafes*; others are known as the *Wartime Meals Service*.

Education

Not the least of the functions of the Ministry of Food is the nutritional education of the consumer. All the modern media of propaganda are used to distribute recipes and information on the preparation of food, to suggest menus and to answer the housewives' questions. Food Advice Centers are located in all regions of the country. They are staffed by trained women who give demonstrations, and in general work closely with housewives, helping to solve their problems and making the accumulated knowledge of food preparation and nutritional values available for the asking. These centers also report the local difficulties of supply and the special problems of local housewives to the Ministry of Food, to assist it in formulating policy and preparing its propaganda and information program.

The Ministry maintains an "experimental" and a "practical" kitchen in London. In the former, methods of preparing and using new food products (e.g. dried eggs and soya flour) are the subject of experimentation, and special work is done for the nutrition advisers, the Wartime Meals Division and other agencies of the Ministry. The "practical" kitchen is designed like the kitchen of an ordinary housewife and recipes are worked out under "practical" conditions to send out to the housewives of the country. In addition, women are brought to London as guests of the Ministry from all over the country to spend a week working in this kitchen teaching the Ministry staff about local ways of preparing food and discussing local food customs and local problems. The Ministry's public relations program is designed to maintain as close and as mutually profitable relations as possible with the most important food preparing center in the country--the housewife's kitchen.

Conclusion

In this brief review of British food and nutrition policy I have tried to bring out the most important reasons why the British people are in general better fed now than they were before the war in spite of reduced supplies and rising costs of food production and imports. Everyone of these reasons can be studied with profit in the United States. If we are to succeed in preventing the war from adversely affecting the nutrition of the people and in improving the nutrition of the worse fed sections of the population, we too must adopt these same principles.

In the first place, food and nutrition policy must be considered as complementary parts of a single whole. Food supplies and nutritional requirements must be closely co-ordinated and if serious shortages arise the former must be manipulated to serve the latter.

In the second place, the prices of important foods must be kept within reach of the lower income groups. Unless this is done, no effective nutrition policy will be possible.

In the third place, if shortages arise inequalities of shopping opportunity must not prevent workers from obtaining the foods they need. Rationing must be adopted fearlessly and the type of

rationing must be determined by the conditions of demand and supply for each food and by its effect on the food consumption habits of the people.

In the fourth place, the special needs of pregnant women, young children and adolescents must be considered. Priority and subsidized distribution of milk, milk products and fruit juices as developed in Great Britain can be easily adopted in the United States.

In the fifth place, communal feeding centers are valuable instruments of nutrition policy. Labor, fuel and food can be used more economically while at the same time workers, miners, school children and the population in defense areas can be better served. A wartime nutrition program in any area should provide for an immediate survey of how workers and school children get their noon meals. This should be followed by a planned expansion of factory and school canteens and publicly provided and managed restaurants. The catering in these restaurants should be supervised by trained dietitians—in Great Britain former domestic science teachers are frequently employed as managers of British Restaurants.

Finally, a program of nutritional education should be developed with the purpose of encouraging the use of nutritionally important foods, raising the standard of cooking in the home and improving the housewife's knowledge of food values.

With these principles as a backbone of a nutrition policy formulated and carried through by the Federal and State Governments working in cooperation there is no reason why the United States cannot maintain and improve the nutritional conditions of its people even in wartime.

British workmen lunch on American lend-lease pork, in factory canteens



The British Program to Improve the Nutrition of War Workers

By Lord Woolton
British Minister of Food

This authoritative report by the British Minister of Food gives us a close-up of how England is attacking its nutritional problems.

IN Britain, "war workers", that is to say, the men and women who are producing the tanks, planes, guns and other weapons of modern warfare, who are working in mills, mines, dockyards, on the railways, and so on, receive the same domestic rations as other consumers. This does not mean that the special nutritional requirements of those who do hard manual work have been overlooked. On the contrary, the vital importance of ensuring that this key section of a nation at war is kept well and "fighting fit" has been a constant preoccupation of myself and my advisers since the day, now nearly 3 years ago, when I took over the office of Minister of Food.

In some countries a system of differential rationing has been introduced in order to assure a sufficiency of food to the manual worker. In Britain, the Ministry of Food has up to now deliberately held out against differential rationing. In this policy we have had the full approval and support of the Trades Union Congress, the representative body of organized industrial workers. The trade unions are, in fact, reluctant to see the introduction of a system of differential domestic rations because of the difficulty of determining, without causing widespread dissatisfaction, general categories of workers entitled to extra supplies of food. This fixing of categories would indeed be a delicate and perhaps invidious task; for in most British industrial undertakings, workers carrying out tasks which might be graded all the way down from "very heavy" to "light" are employed side by side.

In Germany, it is true, workers have received differential rations since the beginning of the war. But it is important to note that German workers are not classified into broad categories of entitlement. Each worker's case is considered individually by the local Food Office on the recommendation of the employer. Such a system must obviously leave a great deal of scope for petty tyranny and chicanery by works foremen.

That we in Britain have been able to maintain a policy of equal rations for all, and yet keep our heavy workers well fed, is due in no small measure to the fact that our food position has up to now

permitted the provision of what I may call a "buffer" supply of energy. That is to say, while some foodstuffs have become scarce, the two staple energy-producing foods, bread and potatoes, have remained unrationed and abundant. Moreover, both bread and potatoes have been pegged by means of subsidies at a low price. Thus the individual consumer, whatever the magnitude of his or her daily effort, has been able to supplement the limited intake of calories provided by rationed foods to any extent that his energy output may demand. It is interesting to note that Germany chose to ration bread and flour and to rely solely on potatoes as an energy "buffer". The danger of this course was demonstrated to the world last winter. Owing to the heavy frosts, there was an enormous wastage in potato stocks, and the food supplies of the country were left in a very shaky state.

Factory Canteens

We have not been content merely to take measures to ensure that abundant and cheap supplies of "buffer" energy foods should be available. I came to the Ministry of Food with considerable personal knowledge of the living and working conditions of the British working man. **Entrusted with the responsibility of maintaining his nutritional status in war-time, I had no hesitation in deciding that the best way to do this was to see that he could if he so wished get at least one square meal a day at his place of work.** It is particularly important in the Britain of today that people should be able to get a meal during working hours. Thousands of workers travel long journeys to their work, while countless housewives have gone into war factories and have little time to spare for the preparation of meals at home.

The task of providing facilities for this "one square meal a day" has been energetically and successfully tackled. In the summer of 1940, a survey of the capacity of existing catering establishments was made, and a campaign was then undertaken to encourage employers to set up canteens for their workers wherever it seemed necessary. The responsibility for deciding where canteens should be established is that of the Ministry of Labour. The Ministry of Food gives its advice in the drawing up of plans, and has the ultimate responsibility of seeing that adequate supplies are directed to the canteen once opened. By the summer of 1942, the number of industrial canteens of all types and sizes had risen to over 7,000.

In some places the provision of suitable eating facilities for workers in small factories still constitutes a problem. My colleague, Mr. Ernest Bevin, the Minister of Labour and National Service, has powers (of which he makes use where necessary) to require firms employing over 250 workers to open a canteen. Many firms employing fewer than this number of workers have canteens. But in practice the provision of an inside canteen for so small a number of people is not always practicable. In some cases, the difficulty

is solved by a number of small firms pooling their resources and setting up a single canteen to cater for all their employees. In others, the answer to the problem is found in a near-by British Restaurant.

British Restaurants

The establishment of British Restaurants has been sponsored by the Ministry of Food with the help of the local authorities. The Ministry takes responsibility for approved capital expenditure and for deficits in operating costs, when these are proved to be unavoidable. The object of British Restaurants is to serve a hot, nutritious meal at about 1/- a head—which is a price within the reach of every worker. Unlike the industrial canteens, these restaurants are open to the general public, but many local authorities give priority to workers at certain rush hours. The first British Restaurant was set up in 1940. Today there are no fewer than 1,800 of them in operation throughout the country. This is an achievement of which I am particularly proud. Plans for several hundred further British Restaurants have already been approved by the Ministry of Food. It has been our policy to encourage their establishment in areas where there are large numbers of small factories without canteens of their own. The workers in these factories are then able to go to the British Restaurant for their mid-day meal. In some instances, where there is no British Restaurant in the immediate neighborhood, the employers arrange to collect cooked food in bulk from a more distant restaurant and serve it to their workers in factory mess-rooms.

Special Allowances

One of the jobs of the Minister of Food is to see that canteens and British Restaurants obtain the food supplies necessary to provide their war-worker patrons with the right kind of meal. **Our policy is to give factory canteens and other "catering establishments" feeding industrial workers an allowance of rationed foods on a scale higher than that for ordinary catering establishments, such as hotels, cafes or restaurants.** For this purpose canteens have been classified into two categories. Category A includes canteens (and, in exceptional cases, other catering establishments) serving workers in the following heavy industries: Brick and cement manufacture; building, constructional and excavational work; mining and quarrying, docks; gas works and coke ovens; heavy engineering and steel construction works; iron and steel works and metal extraction; rolling and tube mills; ship-building and repairing; tinplate works; agriculture and forestry; cold stores operating as part of the Ministry's cold storage control scheme; coal distributive trades.

Category B includes all other industrial works canteens and commercial catering establishments, 60% or more of whose patrons are factory or industrial workers.

Category A canteens etc., receive a meat allowance double that of an ordinary catering establishment, and Category B, one and a half times as much. Increased allowances of sugar, butter/margarine, cooking fat, cheese and preserves are also provided for both categories. In addition, all canteens serving workers in industrial undertakings are entitled to priority supplies of certain unrationed foods. Employers in works without canteens can obtain supplies of tea, milk and sugar for hot beverages to be brewed communally for their work people during working hours. The full scales of allowances for meals and hot beverages are set out in Appendix A. Industrial canteens and British Restaurants also qualify for 'priority' supplies of certain unrationed foods. The scale of allowances is also given in Appendix A. So much for the allowances of foods to industrial catering establishments.

I should like to say something about the arrangements that have been made to meet the needs of special categories of workers. Firstly, miners. The provision of canteens for miners presented special difficulties. Cooking facilities cannot be arranged underground, and the pits are in many cases so far apart that a central canteen would not be accessible to all the men. However, as a result of concerted action on the part of the Ministry of Mines (now absorbed in the Ministry of Fuel & Power), the Miners' Welfare Commission and the Ministry of Food, much progress has been made in the work of providing pithead canteens at the larger, and "snack bars" for the smaller, mines. Our program for feeding the miners envisages, as I stated in the House of Lords last winter, the setting up of 856 canteens to feed 680,500 men. This figure represents about 98% of the miners of the country. Allowances of food to pithead canteens differ slightly from the usual industrial canteen allowances. The variations enable the canteens, if they surrender part of their meat allowance, to obtain extra jam or other preserves for the preparation of packed meals which the miners can take down into the pit.

Seamen and certain classes of fishermen obtain rations on the scale laid down under the Merchant Shipping Act. In addition, we grant special allowances of food to the crews of fishing and tug boats, etc., who by the nature of their work, cannot make use of canteens. To workers in certain "dangerous" occupations, e.g., in the pottery trade; those handling lead and lead products, and workers handling nitro and amide derivatives of benzene and toluene, or exposed to fluorine, we give additional allowances of milk.

Rural Nutrition

The problem of feeding the agricultural worker still troubles me, for it is no easy matter to provide for him the facilities we have been able to build up for his opposite number in industry. What we have done so far is to arrange for the setting up of Pie Centres, from which prepared meals, such as meat pies, snacks, and sandwiches can be distributed. The pie centres are run by

local authorities, by voluntary organizations such as the Women's Voluntary Services and the Women's Institutes, or by nominated individuals. The actual preparation of the food is carried out either by a British Restaurant or by a local baker or caterer. The Pie Scheme came into operation in the spring of 1942; and by the end of August, 1,870 villages had been covered.

Experiments are being made with various other methods of providing workers on the land with a daily meal "off the ration". I am anxious to increase the number of British Restaurants in the countryside; at present some 80 are open in rural areas. In some rural areas, we have opened what are known as "cash-and-carry" kitchens where people may buy cooked meals to carry away with them.

At harvest time and during other seasons of heavy calls on agricultural labour, farmers are allowed to obtain extra allowances of tea, sugar, margarine and jam to enable them to serve snacks to the workers in the field. In addition, all agricultural workers are entitled to a special cheese ration (at present 1 lb. per week). This privilege they share with certain other categories of isolated workers who, like them, are unable to avail themselves of existing communal catering facilities or to get a mid-day meal at home (e.g. underground miners, forestry and threshing workers, canal and land drainage workers, charcoal burners, some railwaymen and quarrymen, etc.).

Vitamins

I have sometimes been asked why no attempt has been made in Britain to reinforce the war-time diet of workers with vitamins in artificial form. There were a number of reasons for our decision not to do so. There was for one thing the difficulty of supplying synthetic vitamins in the necessary quantities, and then again there was the feeling that the state of our knowledge is such that there might well exist some nutrients in natural foods other than those available in the form of synthetic vitamins. But one of the main reasons was our reluctance to encourage the idea to flourish that in order to keep well and fit you should take a vitamin tablet a day.

Fortification of Foods

Upon the advice of my scientific advisers, I have in some cases decided that certain staple foodstuffs should be fortified by the addition of the vitamins and minerals in which our war-time diet of natural foods is deficient. Margarine, for instance, was first fortified by the addition of vitamins A and D in quantities sufficient to make it nutritionally equivalent to butter. Later the content of "D" was doubled to make up for the loss of D occasioned by the shortage of eggs. By raising the rate of extraction of flour to 85%, an adequate vitamin B₁ content in bread has been ensured. Recent research work has shown, however, that long-extraction bread may have a harmful effect on calcium absorption. In view

of the fact that it is desirable to provide a satisfactory calcium intake in war-time, the decision was taken to counteract the effect of a long-extraction flour by adding a small quantity of calcium carbonate. Some people in Britain have been a little disturbed by this measure, fearing that the additional intake of calcium might prove harmful in individual cases. Their fears are quite unfounded. It should be borne in mind that the additional amount of calcium the ordinary person will be taking is equivalent to the amount that would be obtained from an extra one-fifth of a pint of milk daily.

Education

My consistent aim has been and is to make the British people "food conscious" rather than "vitamin conscious". I am convinced that by instructing the nation about the values of different foods and the best ways of preparing them, I am turning to the best account the keen interest in food matters that has resulted from the war-time restrictions of supplies.

My Ministry maintains an advisory service for canteens and canteen managers; the importance of a sound knowledge of nutrition and cookery methods in those serving millions of meals daily to the workers of the country is self-evident. In addition, every possible channel is used to convey food advice to the workers in their own homes. One of the most successful series of war-time newspaper advertisements has been the weekly "Food Facts" advertisements in the press, by means of which the Ministry explains to the public changes in rationing arrangements and changes in the food supply situation, and suggests ways of using the foods that are in plentiful supply. Similar information is given in the daily radio broadcast, known as the "Kitchen Front". Through the "Food Advice Centres" that have been set up in a number of towns, the Ministry's staff of trained dieticians and cookery experts are able to get into direct personal touch with the public, help solve their difficulties, and demonstrate new cooking methods.

Our policy is to provide every individual in the country with the maximum possible domestic rations; to advise him or her as to the best way of using the rations and the changing supplies of unrationed foods; and to direct extra supplies of foods to canteens catering for persons who because of their physical condition or the work they perform need more nourishment than others. **In the general agreement that exists among scientists that the nation on its war-time diet is nutritionally better fed than it was when war started lies evidence of its success.**

Nutrition in Canadian Industry

Our good neighbor to the North has studied the problem of nutrition in industry and has come to several conclusions of value to us.

Recommendations adopted by the Canadian Council on Nutrition

1. Since a multiplicity of effort would annoy industry and labour alike, the primary field of inspection and assistance with regard to food facilities in war industries should rest with qualified representatives of the federal office (Nutrition Services), but local groups are urged to make industry, and the homes of industrial workers, a part of any nutrition program after consultation with Nutrition Services. (See also No. 10).
2. Industrial groups wishing to improve nutritional conditions are urged to get help from Nutrition Services, Ottawa.
3. All plants having war contracts should assist the workers to get nutritious meals of natural foods, with reasonable ease and economy.
4. All plants having war contracts and providing meals to employees should employ or consult a qualified nutritionist or dietitian.
5. Plant-managed food dispensaries should be run on a non-profit basis, or profit should be used to provide (for example) free milk in the plant.
6. Between-meal rest periods, together with an opportunity of obtaining food, are highly recommended. Milk, cocoas, fruit juice or tomato juice are to be preferred as beverages.
7. The consumption of foods of low nutritional value such as soft drinks, candy and sweet goods, must be discouraged in favour of foods of high nutritional value.
8. Where the working day exceeds eight hours, more than one meal or lunch period should be provided at the plant.
9. An effort must be made to change the food habits of workers and this must be done indirectly in the food arrangements, etc., as well as directly by educational methods. The co-operation of the plant medical services and the management, as well as of the cafeteria management, is needed.
10. Co-operation between Divisions of Industrial Hygiene in Provincial Departments of Health and Nutrition Services is urged.



For all-out production, our workers need a balanced diet

Nutritional Status of Our People With Special Reference to War Workers

By Dr. Arthur Knudson

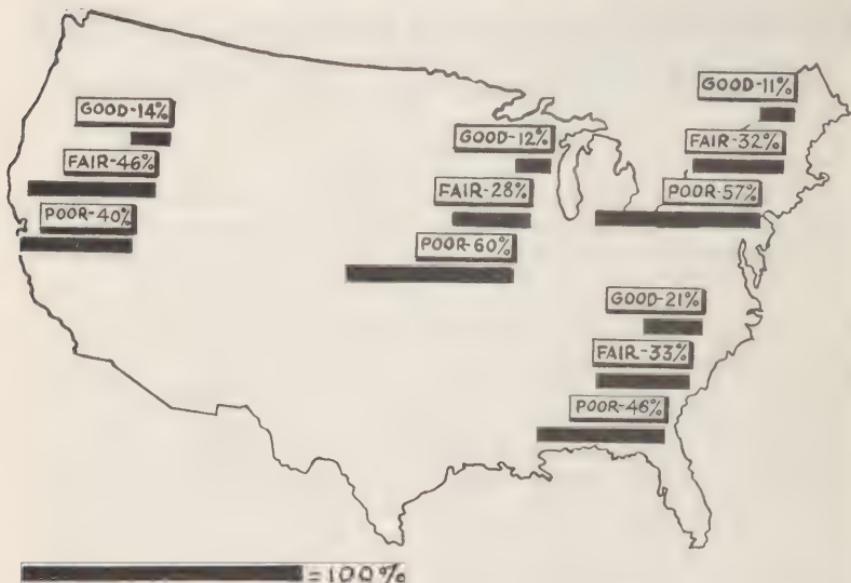
Our workers are not getting the food they need for "all-out" production. Surveys summarized in the following report indicate that a large number of our war workers are suffering from hidden hunger.

THE outcome of this global war, in which we are now engaged, depends not only on our armies, navies, and air forces, but to a considerable extent on what is done to maintain the health, the vigor, and the morale of the workers in industry and on the farms. It is to these people that we must turn for the increase of all the materials needed in modern warfare and one of the most important factors for improving their health and maintaining their morale is proper nutrition. Proper nutrition results in greater working efficiency, fewer absences from work, and a decrease in the number of accidents. We should, therefore, in order to speed up production, bend every effort to see that our people obtain an optimum intake of the food essentials.

The necessary rationing of foods by the government will cause changes in our diets, but it should not interfere with our obtaining the essential food elements and the providing of a balanced and adequate diet because each of the foods listed above has an acceptable substitute. It should also be remembered that some of the foods needed for a balanced diet are expensive articles of diet and many of our people are not able to purchase them in sufficient amounts. Of course, family incomes in the past year or two have expanded in many instances. Then again many people are loathe to change their food habits but the national nutrition program has created a marked interest in nutrition. This interest in nutrition has been particularly stimulated by the emphasis placed on the use of enriched white bread and flour. In 1943, however, the expanded income and an interest in good nutrition will not be enough to assure an excellent diet. Housekeepers will be required to plan carefully, to guard against waste, to know enough about food values to be able intelligently to cope with the shortages which may arise. To take advantage of whatever is plentiful at the moment they will have to overcome prejudices and superstition.

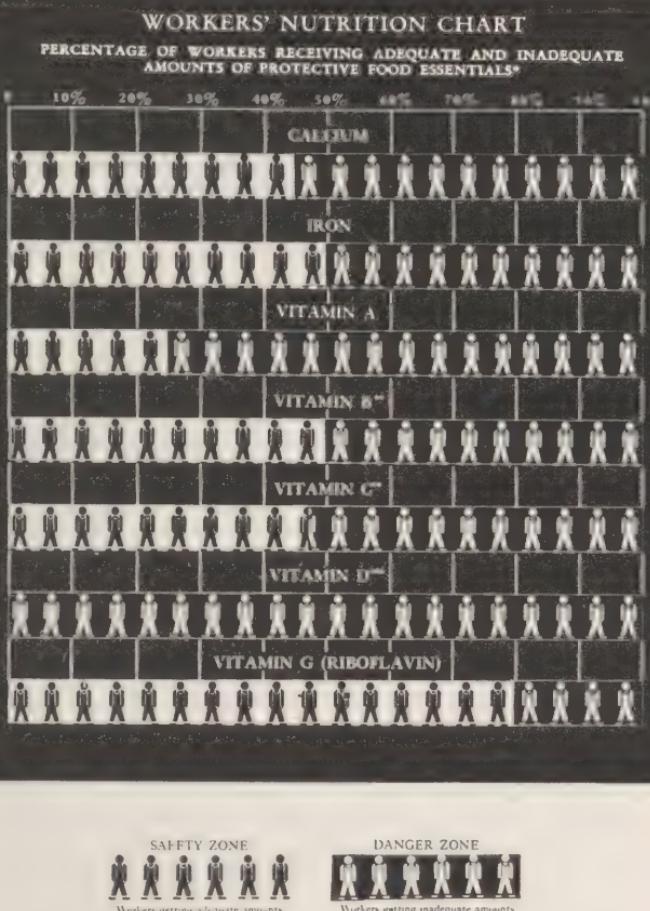
How are these requirements being met? Information gained from dietary surveys, selective service examinations and studies of the nutritional status of individuals and groups have revealed that there is a widespread lack of some of the essential food factors in the diet of many of our American families. One of the most

Diets of American workers



Large numbers of American workers are not eating the food needed for robust health. The above map is based on a nation-wide survey by Drs. Stiebling and Phipard of the United States Bureau of Home Economics

FOOD ESSENTIALS NEEDED FOR ADEQUATE NUTRITION



extensive dietary surveys is that of Stiebeling and Phipard of the Bureau of Home Economics of the Department of Agriculture. They studied the food consumption of families of wage earners and low salaried clerical workers living in industrial centers located in various parts of the country. This survey revealed that only 26 per cent of the workers' families were classified as having good diets, 45 per cent were fair, and 26 per cent were poor. Poor diets were least common in Pacific Coast cities, intermediate in North Atlantic States, and most common in the South. It should be emphasized that these were the families of employed workers, not the unemployed workers or the families of those on relief. Moreover, the dietary standards which were used in this survey were lower in some respects than the currently accepted daily allowances of the Food and Nutrition Board of the National Research Council. Other surveys in both this country and Canada are in general agreement that there is a high proportion of poor diets among the employed population.

Workers Select Poor Lunches

Such reports as these have aroused both the nutritionists and the public to the fact that there are marked deficiencies in the American diet. This is further emphasized by the poor physical condition of many of the draftees eligible for military service. Reports of selective service examinations have indicated that perhaps one-third of the rejections are due either directly or indirectly to nutritional deficiencies. These shocking findings are considered to be a reflection of failure to give sufficient attention to nutrition in health programs.

The prevalence of malnutrition has been investigated by Jolliffe, McLester, and Sherman for the Food and Nutrition Board of the obtained from three types of information. According to the evidence obtained from dietary surveys, they believe the incidence of dietary deficiency is high. Data based on evidence obtained from records of hospital admission are not a true index of the actual state of affairs. Although the evidence obtained on the medical assessment of the nutritional status in samples of the population is not very extensive, nevertheless surveys of certain vitamin and mineral deficiencies indicate that the nutrition of many persons should be distinctly improved. This is particularly true if optional nutrition and not mere adequacy is desired.

Industry is beginning to realize the value of optimum intake of nutrients for promoting efficiency, reducing absenteeism, and decreasing rejects. Optimum nutrition for the industrial worker is of utmost importance in the present war of production for it is obvious that the man behind the fighting lines is vastly important to the final outcome. As Dr. Victor Heiser has pointed out, our production of planes, guns, and tanks, is largely dependent upon the diet of the nation's workers. The first report of the Committee on Nutrition in Industry of the Food and Nutrition Board of National Research Council reveals that there is need for immediate improvement in the meals of defense workers. Evidence from a casual survey of 33 manufacturing plants indicated that, even when good food was provided for the worker, the majority chose poorly balanced meals. In one New England plant the lunch trays of workers were classified as good if they included (1) milk, cheese or food made from milk, (2) fruits or vegetables, and (3) a "substantial" dish. **Of 700 trays observed, 43 per cent were good and 57 per cent were unsatisfactory.** In another plant the lunches of office workers were classified as good, providing they contained all of the requirements given above, fair if it contained only two of the requirements, and poor if it contained only one. **It was found that 39 per cent of the lunches selected were good, 42 per cent fair, and 19 per cent poor.**

It has also been learned that many war workers often arrive at their jobs having eaten hurriedly only a breakfast of coffee and a roll or doughnut. In one inquiry, less than a third had a breakfast with fruit or fruit juice, cereal, eggs, or meat, and very few had milk. For lunch many of these men who were doing heavy

work had but a single sandwich, less than half of them had meat or vegetables, and less than a fourth had salad. For their dinner they did not fare much better. Most of them had meat but many omitted bread, milk, and salad, about two-thirds had only one vegetable. It is obvious that many workers are not choosing or being fed a balanced diet.

Further evidence of the poor selection of good foods by industrial workers was obtained in surveys conducted by Miss Queneau and Dr. Hyman of the New York State Department of Health. They found in one plant that only 24 per cent of the workers ate a good lunch, and 26 per cent ate a poor lunch, even though there was available a liberal choice of protective foods. In another plant only 12 per cent of the workers had good lunches and 41 per cent were poor. In a third factory which offered a very limited choice of foods, none of the factory workers obtained a good lunch, while 77 per cent were classified as poor. Another survey, conducted by Miss Williams of the New York State Nutrition Committee, of a large plant cafeteria located near Albany, New York, revealed that the men's trays contained mostly meat, potato, bread, pie, and milk, and that the girls consumed sandwiches, coffee, and pie. There were few trays with vegetables or salads.

Various other factors contribute to poor dietary intake among workers and among these are the widespread consumption of soft drinks and candy, widely selected for mid-morning or afternoon snacks. These soft drinks and candy contribute nothing to the diet but sugar and most of the American diets are already too high in sugar. Also contributing to poor dietary intake are the dietary habits of workers which are extremely difficult to change. Many of these people have been living on diets made up of white bread, meat, sugar, potatoes, and containing very little of such foods as milk, green vegetables and whole grain cereals or breads which are capable of correcting many of the deficiencies that are prevalent. Many individuals likewise have finicky food traits or are adherents to certain food fats. Then again these large war production plants have grown so rapidly that feeding facilities are in many instances entirely inadequate. As a result of this condition a number of low grade restaurants and stands have sprung up in the neighborhood and their menus are not only limited as to variety but often sadly lacking in quality. Conditions such as these are bound to have adverse effect upon the nutritional status and health of the American worker.

Even though the industrial worker may make a proper choice of foods in the plant restaurant or cafeteria, we cannot be assured that he will obtain the required essential nutrients. Consideration must be given to the proper preparation of foods. This is well brought out by a report just published by Dr. R. S. Goodhart. He found that there was a striking loss in the vitamin content (especially vitamin B₁ and C) of a low cost lunch being served to employees in an industrial cafeteria of a war industry in the New York area. The losses were based on the comparison of the

estimated value of the vitamin content of the uncooked foods as given in standard tables with the natural analysis of the vitamin content of the foods being served. In a meal which cost considerably more, the losses in vitamin content were not as great. Nevertheless, they were significant.

Another recent report on the effect of restaurant cooking on the vitamin content of foods has been presented by Dr. R. S. Harris of Massachusetts Institute of Technology at the 1942 fall meeting of the American Dietetic Association. He points out that food taken from expensive restaurants, cafeterias, and lower class restaurants may have no relation to the nutritive quality of a meal since the vitamin destruction may be equally severe in the foods from each of these places. It was also observed that vegetables prepared in one of the restaurants at the institute showed a considerable loss in vitamins B₁ and C after cooking. When allowed to remain on the steam table they showed a much greater loss. **In some cases the total losses exceed 95 per cent of the vitamin content of the vegetables before cooking.** Dr. Harris believes that a large portion of the cooking losses are due to solutions of vitamins in the discarded cooking water. These results of both Dr. Goodhart and Dr. Harris of the large destruction of vitamins in foods cooked in restaurants emphasize the need for studies to determine if these losses can be minimized. This is very important, particularly, if we are to rely on these cooked foods to furnish some of the recommended dietary allowances of the Food and Nutrition Board.

These reports of the losses of vitamins B₁ and C (thiamine and ascorbic acid) in the preparation of foods are of considerable interest because of the important role these vitamins play in human nutrition. Williams, Wilder, and their associates have shown that adults maintained on thiamine deficient diets develop fatigue, lassitude, and loss of appetite; the more active the individual, the sooner do severe symptoms develop. A number of other symptoms likewise developed, such as depressed mental states, soreness of muscles, and backache. The capacity for muscular work also decreased progressively. Restoration of vitamin B₁ or thiamine to the diet sooner or later brought an end to these signs and symptoms. It was also shown by these workers that a diet containing sufficient thiamine to prevent the development of obvious deficiency disease is not necessarily adequate for the best nutritional state, as larger amounts increased the alertness and attentiveness of experimental subjects and led to increased working capacity. In view of the fact that thiamine deficiency is probably one of the most common dietary deficiencies in this country it is urgent that we should see that the diet of workers contains sufficient amounts to prevent such signs and symptoms developing as outlined above.

Similarly a recent report from the Fatigue Laboratory of Harvard University emphasizes the imperative need for an adequate daily intake of the vitamin B complex if physical fitness is to be maintained. These workers subjected men to hard daily physical work

on a diet deficient in parts of the B complex, notably in thiamine, and at the end of one week all subjects exhibited symptoms of muscle and joint pains, lack of well being, poor appetite, and constipation. With the addition of thiamine the subjects were in better condition and the symptoms were milder, while giving the subjects dried brewers yeast all symptoms disappeared and the usual level of fitness was regained more rapidly and more completely.

As regards vitamin C or ascorbic acid this is a nutritional factor of far reaching importance. There are undoubtedly many individuals suffering from a lack of this factor but detection of mild deficiencies are not so obvious. Reports have indicated that both ascorbic acid and thiamine are lost in heavy perspiration and workers exposed to conditions of high temperatures or working in hot climates need larger amounts of these vitamins. It also seems that exposure to various toxic chemicals, such as lead, toluene, benzene, and T. N. T. destroy vitamin C in the bodies of workmen and therefore workers exposed to these hazards need a diet reinforced with vitamin C or foods such as tomato juice or orange juice that are rich in this vitamin.

In spite of the fact that carefully controlled studies on the nutritional condition of war workers are very limited it is recognized that a large percentage of these workers and their families have been eating diets considerably below the level considered adequate. Improvement in the nutrition of industrial workers is therefore a problem of prime importance at this time. The question arises as to how to meet this situation and what sort of program can be planned which will be helpful to industry?

It would seem that this problem can eventually be best met by a systematic plan of intensive education in nutrition, not only of the industrial workers, but of those who prepare their food at home or in boarding houses. Teaching workers the fundamentals of good nutrition may be accomplished by the use of printed illustrative material for mass education and by individual and group instruction. This is, however, a tremendous and difficult problem and one that should continue after the war. Moreover, it affords an excellent opportunity to make people more food conscious and spread the gospel of proper nutrition.

However, education is a very slow process and definitely limited and it would require a number of years to improve the diets of workers and their families. Another procedure, which would result in an advantage at least for the war worker and the employee, is the serving of a noon day meal in the plants of war industries. This meal must be intelligently planned and properly prepared, and should supply at least one-third of the essential food nutrients. In the last war the British found that the efficiency of war workers was increased in the factories where canteens supplied good meals. In the present war the Ministry of Food, therefore, requires that every establishment employing more than 250 workers must have a canteen which serves a mid-day meal, supplying two-thirds of the

daily requirements of the essential food elements. Night-shift workers who apparently do not want a large mid-shift meal are furnished the "Oslo meal", so called because it was first provided to workers in the Norwegian capitol. These meals consist of whole wheat bread, cheese, milk, carrots, and fruit, such as apple and orange. They are sold at a minimum price and supply the worker with food which he obtains without affecting his ration allowances. Sir John Boyd Orr of the British Food Ministry says: "Improvement of the diet of workmen . . . is followed by increased output without conscious increased effort and also by a reduction in accidents."

Having established beyond doubt that the nutrition of our war workers is an important factor in maintaining their health and efficiency, we must utilize other measures besides the nutritional education campaign in order to immediately improve their nutritional status. Although many of our diets, today, are lacking in some of the essential vitamins and minerals which are perhaps best obtained through natural foods, nevertheless we may find it difficult to get people to adjust their diet to accomplish this result. We should also bear in mind that even though we may plan our meals carefully, we cannot always be sure that the foods which we have prepared have not lost a considerable part of their vitamin content through storage, processing, or cooking. It is logical, therefore, to suppose that products containing these vitamins and minerals so necessary to health can be taken as a concentrated nutrition supplement. These nutrition supplements can be added to the diet or taken separately. The feeding of supplements to war workers to supply essential food nutrients may thus be a highly important factor in more rapidly improving their nutritional status. A preliminary report has recently been made of an experiment carried out over a period of a couple of months in which a supplement of vitamins and minerals were given to a group of war workers. This group was compared with a control group receiving no supplement. While the conditions of the experiment were not as carefully controlled as one would wish, it did indicate that the group receiving the supplement showed a greater decrease in spoilage, absenteeism was less, and their production records rose from week to week to a very high level. Replies to questionnaires given to the experimental group indicated that they slept better, felt less fatigues, and had better appetite.

We need more extended and more carefully controlled experiments to evaluate the role of supplementation, but engaged as we are today in this great global war, and knowing the crying need of our armed forces and our allies, we must do everything possible now to see that our workers are kept in the best of health.



Should factory canteens be required in our war plants?

Nutritional Problems in War Plants

By Dr. May R. Mayers

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A survey conducted by the New York State Labor Department shows that half of the war plants in the state have no lunchroom facilities for their workers. Problems arising from this fact and others are outlined in the following report.

THE importance of the food which is eaten in the factory assumes special significance, when one appreciates fully the poor nutritional status of our population as a whole—the nutritional background from which the worker goes to his job in the factory. A few authoritative reports, such as the following, make this clear:

General Dietary Deficiencies of the Population as a Whole

Stiebling and Phipard¹ of the Department of Agriculture in a study of the diet of families of employed wage earners and clerical workers found that 44% of the families studied failed to get a "fair" diet (59.5% in cities and 16.5% on farms); 76% of the families studied failed to get a "good" diet (92.1% in cities and 49.0% on farms). Twenty-five per cent of all families obtained less than 1.1 mg. of Vitamin B, and 75% less than 1.6 mg. daily—representing a real deficiency.

The U. S. Department of Agriculture in its Miscellaneous Publication No. 452, reports the following deficiencies for families in villages and small cities. (In large cities these deficiencies affected still larger proportions of the people studied):

¹ Stiebling, H. E. and Phipard, E. F., Diets of families of employed wage earners and clerical workers in cities, U. S. Dept. of Ag., 1939 Circ. No. 507.

Calories	Less than 3,000	46%
Calcium	Less than .68 gr.	68%
Vit. A.	Less than 6,000 Int. Units	54%
Thiamin	Less than 1.5 mg.	36%
Riboflavin	Less than 1.8 mg.	48%

Jolliffe, McLester and Sherman² reviewing the prevalence of malnutrition, state: "All surveys, whether conducted by private or by governmental agencies both in the United States and Canada are in general agreement that there is a high proportion of poor diets among the employed population."

Dietary deficiencies, incidentally, have been shown to exist even in population groups with excellent incomes—showing that, above a subsistence level, a good diet depends essentially upon a knowledge of what to eat, and the selection of proper foods rather than upon income. In the factory workroom, it necessarily depends also upon the availability in the factory of such foods and the opportunities afforded the worker to eat them.

The importance of adequate food and eating facilities in war plants to supplement general basic inadequacies in diet on the outside is thus apparent. Its importance will undoubtedly grow as the war progresses. Certainly under present conditions it would seem desirable that the food consumed by the war worker during his working day should, in general, provide **more** than one-third of his total daily food requirements.

Factors Aggravating Dietary Deficiencies in War Workers

Many special situations have arisen in the war industries which have tended to aggravate the dietary deficiencies of war workers. First of all, these workers are in general spending a larger part of their day at work than formerly, and they are working at a higher pace. That they are paid for overtime does not alter the fact that they are expending more calories in energy in their work and so require a correspondingly larger number of calories in food consumption. Their increased earnings, on the other hand, make it possible for them to spend more money than formerly on the food which they buy during their working day.

Other factors creating special nutrition problems for war workers are as follows:

New plants of enormous size are springing up; some of them in agricultural areas remote from eating facilities of any kind. Many workers travel as far as 75 miles or more a day to and from work with the result that they frequently arrive without breakfast. They may pick up some doughnuts and coffee at a

² Jolliffe, D., McLester, J. S. and Sherman, N. C., The prevalence of malnutrition. Jour. A.M.A., March 21, 1942.

roadside stand in front of the factory, or they may go to work without breakfast. In some plants, management is making an effort to provide breakfast for workers, but these breakfasts are often inadequate from the standpoint of good nutrition.

There is good evidence, moreover, that many war workers do not get a warm or adequate meal at night when they get home. Wives, working in war plants, are often unable to provide a hot dinner for their husbands in the evening. Many are too tired at the end of the day to devote much time and thought to the preparation of the lunch box for the following day. Housewives staying at home are often harassed by the need to provide meals practically all day long for school children and various members of the family working on a variety of shifts—all requiring meals at different hours.

Enormous construction projects, such as the construction of an Army Storage Depot, for example, may create an extremely acute situation in a given locality, where not only general eating facilities are lacking but where there may be a lack of adequate water supply, housing, sewage and general public health measures for the protection of the community as a whole—a community which has suddenly been transplanted to the locality. Such abnormal and makeshift living conditions make the need for proper food even more imperative.

Shipyards in some instances present special problems—particularly the smaller yards which are engaged solely in the overhauling and repair of ships. These yards are usually located in areas remote from restaurants or other eating facilities. Because of the intermittent character of the work, it apparently does not pay to keep an adequate number of restaurants operating continuously in the neighborhood. Only when a ship comes in to be repaired are large numbers of workers employed; and then such eating facilities as are available in the immediate vicinity are completely swamped. Between ships, the docks are practically deserted.

White collar workers in the war industries are faced with special problems in the matter of lunch, because of gasoline and tire rationing. It has long been their custom to get into their cars and go to restaurants in the nearest town for lunch. Rationing of gasoline and tires has, however, necessitated their patronizing the restaurants that are within easy walking distance. These restaurants are likely to be inadequate in number; are, in general, unsuited to the new demands put upon them, and many of them have taken advantage of the situation to sky-rocket prices. As a result, increasing numbers of office and white collar workers are bringing lunch from home. The lunch box, and the foods available in the plant to supplement the lunch box, are thus becoming more important than ever.

Eating Facilities in War Plants

In the development of its general war program the New York State Department of Labor very soon became aware of the urgent

need for better nutrition for war workers in the State. In December, 1941, the first concrete steps were taken to evaluate the eating facilities in our war plants. As a preliminary approach to the problem, a question with reference to the existence of a lunch room was included in forms given to applicants for dispensations from the Labor Law, under the War Emergency Act. Analysis of this preliminary data collected from 570 plants in New York State which had asked for dispensations revealed the fact that 412 of them, employing a total of more than 160,000 workers, had no eating facilities whatever. Twenty-two of these plants each employed 1000 workers or more; 42 each, employed between 500 and 1000 workers; and 79 each, employed between 200 and 500 workers.

It was thus apparent that further investigation was necessary.

Eating Facilities in War Plants

Questionnaires were sent out to approximately 2000 war plants asking a number of detailed questions. (See Appendix C.) Approximately 1000 replies were received. Of these, 840 have been analyzed. The more pertinent findings are as follows:

1. **More than one-half (51%) of the 846 plants provided no lunch room facilities for their workers.**
2. **In only one plant out of five (19%) was hot food purchasable.**
3. **Only one-half (52%) of the plants had milk available for their employees.**
4. **In three-quarters (77%) of the plants only 30 minutes or less was allowed for lunch.**

Essentials of Adequate Nutrition in War Plants

Adequate nutrition in the factory hinges on (1) the mid-day meal which includes the lunch box and (2) between-meal nourishment.

1. *The Mid-Day Meal*¹—The extent to which the mid-day meal in the factory can be made to meet the food requirements for such a meal depends upon several factors as follows: (1) The length of the lunch hour; (2) The eating facilities of the plant—availability and location of a cafeteria, lunch-room, etc.; (3) The availability to workers in plants of nutritious foods at prices they are able or willing to pay; (4) Education of the workers to avail themselves of eating facilities and to select nutritious food combinations from those foods which are available.

The lunch box is and will continue to be the backbone of nutrition of workers in industry. Attention must therefore be directed

¹ Corresponding meals on other shifts.

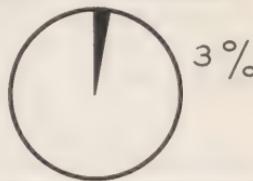
Eating Facilities in New York State War Plants



TOTAL NO. OF PLANTS SURVEYED: 846
TOTAL NO. OF EMPLOYEES: 390,426



30 MIN. OR LESS FOR LUNCH



SELL
SANDWICHES AND BEVERAGES
ONLY



LUNCHROOM AVAILABLE



SELL BEVERAGES ONLY



HOT FOOD PURCHASABLE



MILK AVAILABLE

toward: (a) Improving the food carried in the lunch box—this is a matter of nutrition education for both the housewife and the worker; (b) Providing, in all war plants, proper foods to supplement the lunch box, and a sufficiently long lunch period.

2. *Between-Meal Snacks on day and night shifts*—The importance of between-meal nourishment for increased efficiency and increased production has been amply demonstrated. Only one authority will be quoted: Haggard and Greenberg¹ have shown that increased muscular efficiency follows intake of food in the

¹Haggard, H. W. and Greenberg, L. A., Between-meal feeding in industry, *Jour.-Amer. Dietetic Assoc.*, June-July 1939.

periods between meals when fatigue, poor concentration and a slump in production are commonly experienced. Between-meal snacks have shown a beneficial effect upon the absenteeism, morale and production—in terms of hourly output—of the workers receiving them as compared with workers not receiving this extra nourishment.

That there is popular recognition of the need for between-meal snacks for workers has been revealed in the many requests received by the Division of Industrial Hygiene from employers and insurance carriers, for suggestions for simple foods to be served between meals. One request asked for something which could be readily distributed in paper bags; which would require no refrigeration; which would be inexpensive enough to distribute free of charge. Peanuts and raisins were among the suggestions made to meet these qualifications. Peanuts are high in Vitamin B, and raisins are high in iron.

It has moreover been found that workers tend to leave their work benches many times a day to buy candy and soft drinks at dispensing machines. Some have been known to buy 10-12 bottles of coca-cola a day. Particularly at night, workers find that nibbling is the one way they can keep awake. Some plants have definitely felt that providing a between-meal rest period of 5-10 minutes with some food tends to eliminate greater time lost by frequent interruptions from work to go to vending machines.

Special Problems in War Plants

Preliminary plant investigations by the Division of Industrial Hygiene have made it clear that in addition to the general problems above outlined each war plant has its own special problems. This is true in the field of nutrition, just as it is in the matter of plant medical services; in industrial ventilation; in occupational disease and accident prevention; or any of the other phases of industrial health concerning which industry has always looked to the Division of Industrial Hygiene for technical assistance.¹

In plants which provide their workers with an hour for lunch, for example, and where there are ample restaurants or other eating facilities in the immediate neighborhood; or where workers have an opportunity to go home for lunch, the question as to whether or not they are adequately nourished rests essentially with the house-wife, the boarding house keeper, or the restaurant owner. This is a problem for agencies other than the Labor Department—agencies working in the field of nutrition education for the community as a whole.

In war plants, however, which are remote from restaurant facilities, or where there are inadequate facilities in the immediate neighborhood; where workers are not permitted outside the gates

¹ Technical Consultations with industry by physicians, engineers and chemists of the Division of Industrial Hygiene for the elimination of health hazards is one of the most important of the normal activities of this Division.

during the lunch period, or where only 30 minutes is provided for lunch, and it takes 10 or 15 minutes to get from the time clock to the outside gates of the plant, obviously measures must be taken to provide workers with adequate eating facilities within the plant. In other words, wherever for any reason whatever, workers are of necessity entirely dependent upon the eating facilities and foods available in the plant during working hours, it seems reasonable to expect that adequate eating facilities and nutritious foods should be provided so that workers may be enabled to get a satisfactory meal in the time allotted.

In this connection, it is interesting that personnel managers of war plants are reporting to the Division of Industrial Hygiene that their labor relations definitely deteriorate when they are unable to provide workers with proper food in the plant. This applies to the plant that has a cafeteria which is not functioning properly, as well as to plants having no cafeteria where workers want to be able to buy sandwiches, beverages, or other foods to supplement the lunch boxes which they bring from home.

The Working Personnel: The fact that the working personnel in war plants is rapidly changing to include people who never worked in factories before; women in increasing numbers; and workers too young and too old for the draft is a factor which must be taken into account in considering the types of foods to be served in these plants; and the provisions necessary in terms of eating facilities, etc.

The proverbial worker who came to work with some bologna between the halves of a loaf of bread is rapidly becoming a memory. Young workers coming from school and women have very different conceptions of what is an edible meal.

Length of the Lunch Hour: There has been a tendency to reduce the lunch hour from the 60 minutes normally required by the Labor Law in New York State to 30 minutes. Some plants going on a triple shift have requested a 20 minute lunch period under the War Emergency Act. While a number of such requests have been granted thus far by the Commissioner of Labor for temporary periods, it is the opinion of the Department of Labor that, excepting under very exceptional circumstances, 30 minutes should be the minimum time allowed for lunch.

In applying this general concept, however, to a given plant, one must appreciate that any given number of minutes is a relative quantity as far as the individual worker is concerned. For, the time which he has allotted to him is used up, in part, in going to and from the cafeteria, lunch counter, or the locker in which he keeps his lunch box; getting waited on, etc. Only such time as remains is available for eating, and obviously this time varies inversely with the distance of the individual's work bench from the eating facilities in the plant.

Decentralization of Eating Facilities: Whether or not there is a cafeteria in a given plant, decentralization of eating facilities is

indispensable excepting in relatively small plants. With an increasing number of workers having no more than 30 minutes for lunch, as large a portion of this time as possible should be made available for eating.

Decentralization of eating facilities may be achieved in a number of ways, depending upon the size of the plant and its basic facilities. Plants with a cafeteria may use supplementary food counters from which to serve a limited number of the dishes served at the cafeteria—using hot plates or small steam tables for keeping dishes hot at the counters.

On the other hand, some plants with cafeterias make no attempt to serve hot foods, other than perhaps soup and coffee, at the supplementary food counters. They serve sandwiches, milk, desserts, fruit and vegetable juices and the usual assortment of cold foods sold over counters in plants having no cafeterias.

In one large plant, decentralization is achieved by means of a separate kitchen from which hot foods are put up in paper packets—each packet containing several dishes and distributed in quantity on trays to a series of counters for local distribution to workers. This makes for rapid service of hot food to an enormous number of workers in a remarkably short time.

There has, incidentally, been a remarkable development in paper cups and containers of all sorts as well as paper and wood forks, knives, spoons, etc.

Some Plant Cafeteria Problems: Running a good cafeteria in a war plant is a highly technical business and should be the responsibility of an experienced well-trained person.

Plant Subsidy—Some industrial plants have always found it necessary to subsidize their cafeterias in order to ensure an adequate meal for the 30 or 35 cents which workers are, in general, willing to spend for lunch. Since the war, and increasingly as food prices have risen, the need to subsidize the plant cafeteria has become more urgent. Needless to say, only the largest plants can afford to do this. On the other hand, workers who are now earning more money are willing to spend more than formerly for lunch. Needless to say, the situation in this respect is a fluid one, changing from day to day.

Use of Cafeteria—Plant to plant investigation by the Division of Industrial Hygiene has made it amply clear that many plant cafeterias are used entirely by office and white collar workers. In many plants the cafeteria services less than half the total working staff—more often less than one-fourth. This appears to be more true in large than in small plants, regardless of subsidy.

There are several reasons for this: (1) many workers prefer to bring lunch from home, finding it more to their liking and more economical; (2) workers in soiled uniforms do not want to sit next to the clean stenographer in the cafeteria; (3) where plants are very large, it sometimes takes too long for workers to reach the cafeteria and be waited on in the time allotted for lunch.

Meals served—The adequacy of the food a worker gets in a plant cafeteria depend essentially upon four factors: (1) the kind of foods served; (2) their cost; (3) their preparation; (4) the food selection of the worker; and (5) the length of the meal period.

The kinds of food served, their cost and the extent to which the nutritive value of such foods is preserved in their preparation depend upon the management of the cafeteria. While the concessionaire's incentive to make a profit may in some cases be regarded as working in the direction of providing less food for a given sum, plant management of the cafeteria or even plant subsidy do not on the other hand necessarily ensure adequate food at reasonable prices. It is a technical job and can be well done only by experienced technical personnel—whether under the direction of the management or the concessionaire.

Where workers are permitted a choice, they do not necessarily select foods which ensure adequate nutrition. There is, on the other hand, a definite resistance on the part of most workers to the so-called "set meal" in which they are permitted no choice.

Additional Eating Facilities—It has already been pointed out that large plants having cafeterias may find it necessary to add food counters or food carts or other additional eating facilities for several reasons: (1) As a means of decentralizing the eating facilities so that food may be distributed more quickly; (2) as a means of providing foods for those of their workers—usually the majority—who do not patronize the cafeteria with foods to supplement their lunch boxes; and (3) as a means of providing between-meal nourishment.

Lunch Counters and Food Carts: The Lunch Box—The lunch box continues to play the most important role in providing workers' lunches in the factory. That this is becoming increasingly the case for the office worker because of priorities on gasoline and tires has already been mentioned.

Supplements to the Lunch Box—It is of the utmost importance, therefore, to make available in each plant foods to supplement the lunch box. It has already been pointed out that this applies to all war plants, even many of those in which there is a cafeteria, but where a considerable number of workers do not patronize it.

Such food supplements should always include milk. There may, in addition, be fruit and fruit juices; tomato juice or other vegetable juices; hot vegetable soup and coffee in cold weather; raw mixed vegetables which can be passed over the counter in wax paper or as salads in paper cups; cubes of cheese to supplement protein deficiencies; and sandwiches made of whole grain or "enriched" white bread. Sandwich fillings which combine cheese with nuts and fruit; or meat or fish with chopped raw vegetables are inexpensive, popular and highly nutritious.

In other words, the food supplements should be such as to provide additional food which can be easily dispensed to workers at reasonable cost; food which will provide the necessary vitamins

and minerals which are ordinarily lacking or deficient in the food brought from home.

The importance, from the standpoint of basic nutrition, of the foods made available to workers in the plant will be inverse ratio to the combined adequacy of their nutrition on the outside, and the adequacy of the lunch box which they bring from home.

The Lunch Counter or Food Bar—Almost any small plant can set up a counter at a convenient point over which simple foods such as those above indicated may be served.

A lunch counter or bar such as one is accustomed to associate with a drug store lunch counter would admirably suit these requirements. Such a bar can be as simple or elaborate as one wishes to make it—both as regards size, construction and equipment. In its simplest form it does not even require mechanical refrigeration. A long ice chest such as one was accustomed to seeing in the soda fountain of the old-fashioned candy store would serve the purpose adequately in the small plant.

The equipment, similarly, is subject to great variation and flexibility depending upon the size and needs of the individual plant and the funds available. No equipment beyond the ice chest is required to serve milk, fruit and vegetable juices and sandwiches. On the other hand, one may have a malted milk shaker, an ice cream compartment; fruit and vegetable juicers; a hot plate for cooking soup; other simple gas or electrical equipment for a limited number of made-to-order dishes; a coffee urn, etc.

One advantage of this type of lunch bar is that foods are not usually prepared far in advance, as is all too common in cafeterias. Consequently there is, in general, less re-heating of foods and less incentive to endless juggling of left-overs from day to day. That prolonged heating and re-heating of foods results in a substantial loss of nutrients—particularly important vitamins—is a well established fact.

Such a lunch bar or counter has a place not only in the plant which lacks a cafeteria. It is equally useful as an adjunct to the cafeteria in large plants where it fills several needs: (1) It supplies food to those workers who prefer to bring lunch from home and do not patronize the cafeteria; and (2) it helps to decentralize eating facilities in plants that are so large as to make it impossible for many workers to reach the cafeteria from distant parts of the plant in the time allotted for the meal period; (3) it can serve as the point of distribution of either hot or cold meals sent into the plant by concessionaires; and (4) it can be made a centre for serving between-meal nourishment.

Lunch bars of this type can provide all of the necessary nutrients for a worker's meals in the factory.

Food Carts—Food carts on wheels are especially useful for the distribution to workers of between-meal snacks. They can be used economically in the place of food counters in some plants to decentralize eating facilities. They may be simple in design; and there

may be no attempt made to transport hot food. On the other hand, some food carts are equipped with electrical connections which can be plugged in at fixed places at various points in the plant. A suggestion has been made that the use of the fireless cooker principle in food carts would make it possible to transport hot soup and coffee without any electrical equipment of any kind.

Thermos jugs of large size are also used to good effect for soup and coffee especially.

In a small plant, a large cauldron of hot soup or an urn of hot coffee will remain hot long enough to be distributed without any special provisions for heating.

Food Priorities for War Workers

We are embarking on an extensive food rationing program. Priorities in foods for our armed forces and our allies abroad are being given extremely careful thought. It is not too early to begin thinking about the steps which will be necessary to ensure adequate food requirements for our war workers—our Industrial Army—in deciding upon future food priorities. Special ration cards for war workers to be used exclusively for purchase of food in the plants where they work may be one approach to this important problem. Food priorities for war workers to ensure adequate nutrition and maximum production must be forthcoming by one means or another, regardless of food shortages for the civilian population.

Nutrition Code

In considering the development of rules for minimum food requirements and eating facilities for war workers, the New York State Department of Labor has proceeded on the theory that legal control should be limited to war plants in which for any reason workers are found to be **entirely dependent for their food during working hours, upon the eating facilities within the plant.** In other words, if workers have time enough to leave the plant (and are permitted to do so) and they go home for lunch; or there are adequate eating facilities in the neighborhood of the plant, there would seem to be no reason to require that the employer do anything

Mobile food carts help feed war workers. Unfortunately, many of them contain food of little or no nutritional value



about it. It is solely a problem of community nutrition education. On the other hand, if workers have insufficient time to leave the plant; or where the plant is remote from other eating facilities; and particularly if under those circumstances the lunch hour is short (30 minutes or less) it is felt that the worker should have food made available to him so that he may be ensured the opportunity to obtain proper nourishment in the time allotted.

The legal basis for the proposed Code now under consideration by the Labor Department, is to be found in Sections 200, 205 and 162, Subdivision 5 of the Labor Laws as follows:

200—General duty to protect health and safety of employees.

All places to which this chapter applies shall be so constructed, equipped, arranged, operated and conducted as to provide reasonable and adequate protection to the lives, health and safety of all persons employed therein. The board shall make rules to carry into effect the provisions of this section.

205—Prohibition against eating meals in certain workrooms. No employee shall take or be permitted to take any food into a room of any working place where lead, arsenic or other poisonous substances or injurious or noxious fumes, dust or gases exist in harmful conditions or are present in harmful quantities as an incident or result of the business carried on in such working place. Notice to the foregoing effect shall be posted in such room. No employee, unless his presence is necessary for the proper conduct of the business, shall remain in any such room during the time allowed for meals. The employer shall provide a suitable place in such establishment in which the employees may eat.

162, Subdivision 5

The Commissioner may permit a shorter time to be fixed for meal periods than hereinbefore provided. The permit therefor shall be in writing and shall be kept conspicuously posted in the main entrance of the establishment. Such permit may be revoked at any time.

The Labor Department's Nutrition Program

From the above discussion it is apparent that the State Labor Department is concerning itself solely with the food which workers eat on the job and the eating facilities provided for them in the plants where they work. It leaves to agencies responsible for community health the nutrition education program as it involves the housewife, the restaurant keeper, the grocer and all others responsible for the worker's nutrition outside of working hours.

Preparation by the housewife of the lunch box which the worker takes to the factory is also part of the community approach, since it is logically included in the education in nutrition given to the

housewife by these agencies. However, the Labor Department is prepared, and is now engaged in, educating the worker to want the type of food in his lunch box which his wife is being educated to prepare for him. This provides an excellent example of how well these separate activities dovetail into one another and provide a basis for complete cooperation without duplication.

The greatest contribution that the Labor Department considers that it can make in the field of nutrition for the war worker—indeed, its unique contribution—is that which relates to his nutrition during the hours he spends in the factory. The reasons underlying the separation of jurisdictions above indicated, are practical ones—having to do with efficiency and economy of administration as well as with the legal mandates which determine the responsibilities of the Department of Labor for the protection of the lives and well-being of the workers in the State of New York.

Between-meal Feeding in Industry

By Leon A. Greenberg, Ph.D., and Howard W. Haggard, M.D.

The Laboratory of Applied Physiology, Yale University

Will "pick-me-up" snacks served in factories help step up production? If so, what kind of foods should be served? The following article answers these questions.

IN 1927, Haggard¹ pointed out that a feeling of tiredness and a decreased production in industrial and clerical operations, occurring in the late morning and late afternoon, might arise from causes other than true fatigue such as develops from violent exertion. He suggested that one of the causes might be what is called the "accessory phenomena" of hunger, among which are irritability, disinclination to work, and a feeling of tiredness. Such phenomena begin to develop in varying degrees among different individuals one to three hours before the time of the regular meals. They are relieved by taking small amounts of food. Haggard expressed the belief that the primary disturbance was a decreased utilization of carbohydrate by the body which may occur at these times. He suggested, therefore, that the food for between-meal feeding should contain readily assimilable carbohydrate.

In 1935, we² reported the results of a two-year study of the influence of between-meal feeding upon the rate of production among factory workers. We were able to demonstrate definite improvement in output in certain types of piecework when food was given to the employees mid-morning and mid-afternoon. We reported also certain general limitations to the effects on production; the improvement did not and could not occur when the pace of the work was set, not by the individual worker, but by the rate of conveyors and of material supply. When, however, the occupation was such that the workers themselves set the pace, production was maintained more steadily and at a greater total output when the workers received between-meal-feedings than when they did not. In some instances the sustained increase of production was as much as 10 per cent.

Even among those workers whose maximum rate of production was set by the conditions of the occupation—as the conveyor line—there was a noticeable increase in cheerfulness and a decrease in irritability and the feeling of tiredness when the workers were given between-meal feedings.

¹ Haggard, H. W.: *Science of Health and Disease*. 1st ed., pp. 421-422. New York: Harper & Bros., 1927.

² Haggard, H. W., and Greenberg, L. A.: *Diet and Physical Efficiency*. New Haven: Yale University Press, 1935.

In 1935, Comstock and Eddy¹ reported a reduction in industrial absenteeism and improvement in disposition and well-being among employees following the introduction of supplementary luncheons at the time of the usual rest periods. In 1939, we² confirmed these findings in a study made on clerical employees.

A considerable number of industrial organizations now make food available for supplementary feeding of employees. With the present extension of this practice of between-meal feeding, the question of the nature of the food to be used becomes one of increasingly practical importance.

For reasons to be given later in a discussion of the physiological principles underlying between-meal feeding, we³ stated that a primary requisite of the food is that it shall contain not less than 20 to 30 gm. of carbohydrate. But our views as to the general nature of the food to supply the carbohydrate have altered with experience gained in studies of between-meal feeding in factories and offices. Our attention was at first fixed on only two requirements of the food used for between-meal feeding: (a) that it should supply carbohydrate; and (b) that it should put no burden on digestion. To these ends we recommended any readily assimilable carbohydrate, even sugar itself.

In studies made under factory conditions, however, it became increasingly clear that the two requirements were inadequate. The food taken by the employee between meals, whether supplied at the factory or brought by the employees themselves, is subtracted from that of the regular meals and hence is an integral part of the diet as a whole. The energy content of the food given at two between-meal feedings might amount to 300 to 400 calories and thus constitute as much as 15 per cent of the total intake of food. It was further evident that the diets of many of the employees were actually deficient in vitamins and minerals, or verged on such deficiency. Supplementary feedings with foods containing only carbohydrate further exaggerated these deficiencies. This feature of supplementary feeding constitutes the only valid criticism against eating "between meals." To obviate it, the food selected should contain both minerals and vitamins in addition to 20 or 30 gr. of carbohydrate.

There are, however, practical difficulties in achieving this desirable end. It is a simple matter for the dietitian to select foods for supplementary feedings that are highly desirable from the dietary point of view; but there may be practical difficulties in preparing and serving such foods under working conditions in the factory or office.

¹ Comstock, L., and Eddy, W. H.: The effects of a supplementary rest period luncheon on industrial absenteeism. *J. Am. Dietet. A.*, 11: 239-242, 1935.

² Haggard, H. W., and Greenberg, L. A.: Between-meal feeding in industry: effects on the absenteeism and attitude of clerical employees. *J. Am. Dietet. A.*, 15: 435-439, 1939.

³ Ibid.

In studies previously reported, we have generally given milk. And since a glass of milk supplies less than half an ounce of carbohydrate, we have supplemented it with breadstuffs or fruit. The combination used fulfilled satisfactorily all nutritional essentials of between-meal feeding and can be highly recommended whenever conditions are such as to permit convenient and fully sanitary handling and serving.

Under ordinary conditions in the factory and office, these foods cannot be served without special preparation and interruption of work; that is, the workman cannot obtain the food near at hand, and at any time he desires, with the minimal interruption of work. Chiefly because of this, automatic dispensers of candy and soft drinks have been installed in some factories. Both of these foods satisfy the desirable features for foods served routinely under working conditions, except the highly important one of nutritive value. Unless special care is taken in selecting the candy or beverage, or they are fortified with vitamins and minerals, they are undesirable nutritionally. The same fact applies to pastry served from a movable canteen. Pastry, however, can be readily fortified by the addition of Brewer's yeast and thus satisfy nutritional needs of the diet.

Criticism of Supplementary Feedings

The general principle of between-meal feeding which we advocate has received some criticism, usually based on one or more of the following beliefs:

That eating between meals:

- (a) Puts a burden on the digestive activities of the stomach;
- (b) Decreases the inclination and capacity to do work; and
- (c) Spoils the appetite for the "regular" meals.

In regard to the first contention, we have previously pointed out¹ that the stomach is burdened by the large size of meals, rather than their frequency. Babies, invalids, convalescents and others with "delicate" stomachs are fed small amounts of food at frequent intervals. The digestive burden on the stomach is lessened rather than increased by dividing the total intake of food into a greater number of meals than the conventional three. The worker who eats between meals will eat no greater total amount of food during the day.

The second criticism, that the inclination to work is decreased by taking food, is based on the common observation of this disinclination following a large meal. Again, it is not the taking of food which imposes the limitations but the large size of the meal

¹ Ibid.

and the consequent burden on digestion. The fact that a large dinner causes sleepiness does not imply that a light breakfast or a light mid-morning "snack" should be omitted to avoid sleepiness.

The idea that eating between meals "spoils" the appetite is derived largely from household experience with children who are permitted to eat sweets within an hour or less prior to the regular meal time. For a short time hunger may be diminished after taking even a small amount of such food. The child permitted to eat shortly before a meal may then have no appetite for the meal but becomes hungry later. This fact does not, however, apply to moderate amounts of food eaten at 10:00 or 10:30 a.m. and at 3:00 to 4:00 p.m. or at corresponding periods during a night shift. The food containing an adequate supply of accessory food elements is simply taken earlier than the regular meals to obtain the advantages of a more sustained supply of readily available sugar for metabolism.

Carbohydrates in Supplementary Feedings

It has long been recognized that muscular exertion cannot be sustained, that there is a feeling of tiredness and, in extreme instances, even collapse, when the supply of available carbohydrates in the body, as indicated by the concentration of sugar in the blood, is markedly depleted. Krogh and Lindhard¹ have shown that men forced to live on a diet very low in carbohydrate perform muscular work less efficiently and on performing the work become more tired than do men fed adequate amounts of carbohydrate. These are extreme conditions, but rarely indeed does bodily function pass abruptly from efficient to inefficient operation on change of conditions. The alteration is gradual from a maximal efficiency under favorable conditions to minimal efficiency under unfavorable conditions. This fact undoubtedly operates in regard to the carbohydrate metabolism. When carbohydrate constitutes a considerable portion of the fuel being used for liberation of energy, efficiency is high; when it forms a small part, efficiency is low. These facts are generally admitted; our only additional statement is that the change in efficiency is gradual and not abrupt in passing from high to low carbohydrate utilization. It is not necessary to obtain acetone and ketone bodies in the urine before the body starts working inefficiently; it is working in some degree less efficiently long before this extreme state is reached.

It is universally recognized that "weakness" may occur in those who severely restrict their food intake to lose weight; we believe that a similar, although less marked weakness, may occur in the hours between meals even in those on diets adequate in total calories.

¹ Krogh, A., and Lindhard, J.: The relative value of fat and carbohydrate as sources of muscular energy. With appendices on the correlation between standard metabolism and the respiratory quotient during rest and work. Biochem. J., 14: 290, 1920.

Soon after eating meals containing carbohydrate, the concentration of sugar in the blood rises and then, during the next three or four hours, it gradually falls to the basal level at which it is found before breakfast. For three or four hours after a meal, carbohydrates constitute a larger proportion of the fuel burned by the body than is the case when the concentration of sugar falls to the basal level. We have shown² that muscular efficiency varies with the rise and fall in utilization of carbohydrate. We believe further that the basal state of sugar utilization is often associated with what are known as the accessory phenomena of hunger, a feeling of tiredness, irritability, despondency and disinclination to do work.¹ The pleasurable invigoration that quickly follows the taking of food is, we believe, due to the consequent increase in carbohydrate utilization.

It is probable that there are wide individual differences, both in the rate at which the utilization of carbohydrate decreases in the hours following meals and also in the response to this decrease. Many individuals, particularly if past middle age, can omit lunch and go without food between the morning and evening meal for 11 hours without discomfort. At the other extreme, a considerable number of individuals, especially if young and particularly girls, cannot go from one regular meal to the next without eating, for they may collapse if they attempt to do so.

The condition, now recognized in its extreme form as hyperinsulinism, throws some light on the conditions being discussed here. Hyperinsulinism is the opposite of diabetes. The diabetic is weak because, even though he may have a high concentration of sugar in his blood, he cannot utilize carbohydrate; the individual with hyperinsulinism, on the other hand, utilizes his store of carbohydrate so rapidly in the first few hours following a meal that it is depleted; he then becomes weak and may faint or have convulsions unless he receives further carbohydrate. Diabetes, on the one hand, and hyperinsulinism on the other, are extremes between which the variation in normal individuals falls. The average individual finds it beneficial to eat between meals in that he gains some feeling of well-being, some relief from tiredness, and increased productivity; and while, as we have said, there are some, especially those of middle age or over, who do not experience these benefits, there are others, usually young and especially girls, who find between-meal feeding a necessity in preventing marked tiredness and decreased productivity.

Selection of Food for Between-Meal Feeding

The accompanying table shows the practical features in connection with the selection of foods for between-meal feeding:

¹ Ibid.

Table I

A. Practical Features in Service:

- (1) Can be easily and quickly consumed.
- (2) Can be preserved until time of use without spoilage.
- (3) No danger of contamination.
- (4) Does not have an organic residue which may litter the working quarters.
- (5) Does not come into direct contact with the workers' hands—no contamination of food or soilage of hands if employee is doing delicate work.
- (6) Appeals to a wide range of taste, even with repeated use.

B. Nutritional Factors:

- (1) Contains adequate vitamins and minerals and thus makes definite contribution to total diet.
- (2) Readily digestible and rarely causes gastric disturbances or allergic reactions.
- (3) Contains a minimum of 1 ounce of carbohydrate per serving.

A great many readily procurable foods fulfill all of these requirements. A glass of milk, either plain or chocolate, drunk from the container together with a cheese, meat or peanut butter sandwich made with fortified bread (and fortified peanut butter) and served in oil paper would satisfy them. The requirements would be satisfied also by well-made doughnuts or other pastry or cookies if adequately fortified with brewer's yeast and wrapped for servings. Likewise they would be satisfied by a thick soup served in a suitable container for drinking and with reinforced crackers. Fruit juices—excepting tomato—give the necessary amount of carbohydrate and also—including tomato—supply vitamins and minerals. Soft drinks are to be discouraged unless they are made of generous amounts of natural fruit juices or are reinforced with vitamins. Candy is undesirable unless it contains sufficient nuts and fruits to supply the vitamins or is reinforced with vitamins as by the addition of adequate amounts of brewer's yeast.

The foods listed here are given only as examples. The actual selection of foods can be made only on the basis of local operating conditions, the desires of the employees, and the kind of dispensing which is feasible at the plant. The cost, as well as the quality of the food, is an important factor. It may be at times advisable for the plant to partially subsidize the food so that it can be served not only without profit but at a very low cost.

Should War Workers Be Fed Vitamins?

By Howard W. Haggard, M.D.

Director, Laboratory of Applied Physiology, Yale University

Doctors, nutritionists and scientists are today engaged in a controversy regarding the desirability of feeding "pep pills" to war workers. The following article presents the case for the affirmative.

THE problem of supplementary feeding in industry has occupied the attention of this laboratory, as opportunity has afforded, for the last 14 years. And from our experience the problem, as we see it, is divided into two distinct parts. The first concerns the immediate and temporary invigorating effect of properly spaced between-meal lunches and is dealt with by Dr. Greenberg and me in a separate paper.¹ The second concerns the long-range beneficial effects obtained from the correction and avoidance of dietary deficiencies with supplements intended to supply accessory foods which the worker may not obtain in adequate amounts in his ordinary diet. This paper deals with the second part of the problem.

The dietary deficiency, to which in recent years most attention has been given, is that of vitamins. This arose primarily from the discovery that certain serious diseases of human beings and of domestic animals were due to failure to obtain in the diet small but essential amounts of chemical substances to which were given the name vitamins. The prevention and treatment of these diseases could be effected by correcting the inadequacy of the diet or administering medicinally the needed vitamins in a concentrated form.

One of the most beneficial applications of these discoveries was that of infant feeding for the promotion of the growth and health of the child. By gradual education of the mother and the direct prescription of the physician, infant diet has been greatly improved, special foods rich in vitamins have been developed for children and it has become the general practice to supplement the diet with vitamins either as natural products, such as cod liver oil, or as vitamin concentrates. The results have been striking in the prevention of diseases once common, such as rickets, and in the promotion of growth and health.

Growth is measurable and actual disease is evident. The adult—the industrial worker—has ceased to grow and except under unusual conditions of dietary deficiency, as in the actual privations of wartime, as now in certain European countries, or among the poorer inhabitants of certain limited regions in the southern part of the United States and among chronic alcoholics in any country, the

¹ See pp. 92-97.

actual and acute diseases of dietary deficiency are unusual. There is no need and no justification for supplementing the diet of the adult population of the country with vitamins for the prevention of the serious disorders of vitamin deficiency. The American diet of adults is, with rare exceptions, adequate to prevent such diseases.

The fact, however, that we do not have many instances of such diseases as pellagra, beriberi and scurvy, due to serious vitamin deficiency, does not signify that the average American diet is an entirely adequate diet. The crucial feature here is one that is often not clearly understood; it is implicit in the fact that good health is not the absence of disease. The misconception that good health is only the absence of disease arises from experiences which everyone has had with the common infectious diseases; they are ordinarily either present or absent and the individual, so far as they are concerned, is correspondingly either ill or well. Thus one does not have varying degrees of physical inefficiencies due to pneumonia; if he has it, he is ill and in bed and when he recovers, he is well. This definite presence or absence with corresponding illness and recovery does not apply to deficiency of vitamins.



Courtesy of Kings Feature Syndicate Inc.

Effect of Lack of Vitamins

Vitamins are essential to the normal operation of the body. When the diet does not supply vitamins in adequate amounts, this operation is impaired. If the deficiency is very extreme, the impairment is correspondingly serious and appears as a definite disease—one to which a name can be given by the physician. Far more often, however, the deficiency is much less; the diet supplies enough vitamins to prevent disease but not enough to permit the fullest bodily efficiency. The man may then be "healthy" by the common standard that he is not ill; but at the same time he is not in "best health;" he is not as efficient as he would be if the operation of his body were not, to some extent, impaired.

One of the great difficulties in detecting such inefficiency is that, unlike actual disease, it does not have unmistakable symptoms. The symptoms are there, but they cannot be found by ordinary medical examination. They may consist of such common disturbances as irritability, tiredness, and loss of vigor and efficiency. Everyone has such symptoms from time to time and from many conditions, besides lack of adequate diet, which interfere with the normal operation of the body. There is no specific type of inefficiency which is characteristic of moderate deficiency of vitamins and thus allows the deficiency to be easily recognized. But the fact that it is not easily and clearly recognized does not signify that it does not exist.

All authorities on nutrition—even those who are most vehement against the direct use of vitamin supplements in industry—are in unanimous agreement that such deficiencies exist among our industrial population. This unanimity is not judged here on the basis of factory tests or laboratory tests—which will likewise be discussed later—but upon a universal policy which indicates unmistakably the belief. The efforts of many agencies, supported fully by authorities on nutrition, are directed to the improvement of the American diet. Educational effort is being intensively applied to teach the housewife, the factory worker and the boy and girl to eat more of the vitamin bearing foods—the protective foods. Now, as said earlier, the actual diseases of vitamin deficiency are rare in the United States. Certainly the extensive and intensive education for better diet is not being directed to eradicate a few cases of beriberi, scurvy and pellagra among people in hospitals. If it were, then the effort would be a vast waste; one that was out of all proportion to the end to be achieved. In reality, this effort can have a justification which must be based explicitly on the following points:

(1) Less than the optimum amount of vitamins (and other accessory foods) in the diet leads to inefficiency or other manifestations of ill health which do not show as definite diseases.

(2) The average American diet is deficient in the optimum amount of vitamins (and other accessory foods).

Failing agreement on these two points there is no basis or justification for the present campaign for better nutrition in the United States. And agreeing on them, as all nutrition experts must if they believe in education for better nutrition, then it must follow as an inevitable corollary:

(1) The industrial worker eats the average American diet.

(2) The diet of the industrial worker therefore contains less than the optimum amount of vitamins (and other accessory foods).

(3) Consequently some proportion of industrial employees are not working at the best efficiency in the war effort.

(4) The efficiency of these workers, and correspondingly their production, could be increased by remedying their deficiency.

It appears logically impossible for any individual, who agrees that American diet should be improved by education or any means, to deny that this agreement implies agreement with the 4 points given above. This feature is stressed here because some individuals, who agree with the principle of better nutrition for America, simultaneously disagree with the need for vitamins for industrial workers. Their disagreement, as will be seen, is not in reality so much in the principle as in the method by which the worker can best obtain the vitamins.

Difficulty of Diet Studies

Theoretically, it should be possible to go to the factory and make a study of diet in relation to production and settle with scientific certainty the question of the influence of diet on production. In reality, this is difficult. The first difficulty lies in the fact that perhaps 50 to 60 per cent of all workers have, at present, a diet fully adequate in vitamins; any inefficiencies they had would not be corrected by feeding any amount of vitamins because they would not be due to lack of vitamins. This approximation of 50 or 60 per cent does not apply uniformly to all workers in all localities. In one factory, 80, 90 or 100 per cent of workers might have adequate diets; in another, only 10, 15 or 20 per cent. A study made on an especially well fed group of workers—say the American soldier—might show no benefit from supplements while one made on a poorly fed group might show exaggerated results.

Furthermore, there are greater difficulties confronting anyone attempting to determine the influence of diet or any other measure on such matters as industrial production, absenteeism, accidents, spoilage and fatigue. Management policies, factory discipline, and the nature of available records demand a compromise between experimental principles and the exigencies of production. These difficulties, I regret to say, are less well known to the laboratory

investigators who restrict their experiments to rats and controlled human subjects. The measurements to be made in the factory do not have the simplicity inherent in the positive presence or absence of disease or a considerable gain or loss of weight. Instead, what is dealt with are highly complex matters which involve many variables and which can be evaluated only indirectly. It is not isolated fragments of behavior which must be studied but total behavior. And this total behavior is influenced not only by the conditions of the experiment but also by emotional conditions and environmental states which have their origins both inside and outside of the plant and are often apparently remote from the conditions under study.

No experiment can be designed which beforehand will take into account all possible variables. It is in part because of this fact that physiological studies in industry have progressed slowly; that they have often become entangled in disagreements.

We of this laboratory have made two such studies in a large defense plant. In both studies, when all experimental conditions were controlled as rigorously as the conditions of management permitted, there was a moderate but definite improvement in production by men fed vitamins, a marked decrease in spoilage and accidents, and a considerable decrease in absenteeism. We are definitely of the opinion that increasing the vitamin intake of the American worker would be highly beneficial in production for the war effort.

As we look at the situation, there is general agreement on this last point. The disagreement is primarily on how the intake of vitamins (and other accessory foods) should be increased. In our factory experiments, we used the forthright procedure of giving the men vitamin concentrates incorporated in wafers which they ate. This procedure of giving "pills" has been considerably criticized and with some apparent justification. Vitamin concentrates have been extensively exploited to the public by proprietary manufacturers as panaceas. Everyone has become disgusted with the high pressure salesmanship which gives the mistaken idea that vitamins are medicines. In reality, they should be considered so only when the physician prescribes them for the treatment of disease which has actually developed. When vitamins are given to the baby as cod liver oil or irradiated ergosterol, these substances are not medicines; they are supplements to the baby's diet.

The one sound and serious objection to the use of vitamin supplements for industrial workers is that the practice interferes with education for good dietary habits. I sympathize with this point of view but I cannot sympathize with those who, during this time of war, exploit it to discourage the use of vitamin supplements in industry.

Study of Workers' Diets Needed

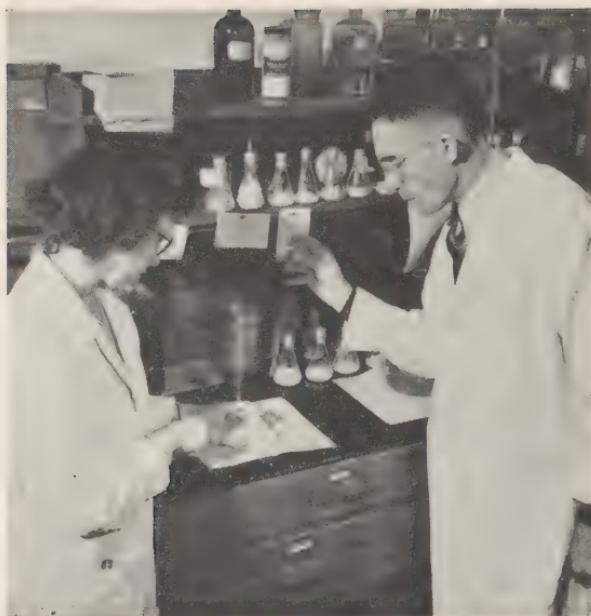
In the course of the nutrition studies that we made in factories some years ago, we recognized that many employees probably had dietary deficiencies. But we were not, at that time, investigating this matter. In respect to it, we suggested only that a systematic study of the workers' diets was badly needed and that the results from it would guide education toward the improvement of the nutritional state of industrial workers and their families. We placed the time at 10 years of intensive nutritional education with a parallel and equally intensive education in economics, plus possible government-subsidized lowering of prices on the most desirable foods.

I believe in education as the sound and proper method of improving diet but I do not believe that the principle, however, correct, should be used stubbornly to impede war production. There are facts to be considered as well as principles. Can an improvement in factory feeding, in home feeding, in national food habits, be effected before the war effort is over? It is obviously upon this effect that we must concentrate our attention. There was time for education before the war; there will be time after the war; and it can go on during the war. But for the present, our attention is focused, not upon normal, logical and rational conditions, but upon the abnormal, illogical and irrational conditions of wartime.

If the use of vitamin supplements were to increase the production in American factories by 1 per cent, if they were to make even this small contribution toward decrease in absenteeism, spoilage, and feeling of fatigue after long hours, then, to my mind, the procedure would be rational, wise and economical, no matter what the cost. The composite statistical forecasts for the increase in total industrial production in this country for 1942 range from 1 to 15 per cent with an average of 9 per cent; an additional increase of 1 per cent from nutritional improvement would, therefore, be of high order.¹

The opposition directed against the use of vitamin supplements is more vigorous than that against fortified foods. The same individuals who object to feeding supplements have themselves advanced and consummated the idea of fortifying ordinary foods with synthetic vitamins, as in the addition of vitamin B₁ to bread. The rationalization seems to be that the milling of bread removes most of the B₁ in wheat and education has failed to lead the public to eat whole wheat bread. Now in the factory where meals are served, the method of preparation, particularly the use of the steam table, removes vitamin B₁ as effectively as does the milling of wheat; therefore, by precedent it should be rational to add vitamin B₁, preferably as Brewer's yeast, to the food served in the factory to replace the vitamin lost in preparation. Education has failed, so far, to teach the wife of the factory worker how to provide a

¹ The Prospect for 1942. Abstract of material presented at the 103d Annual Meeting of the American Statistical Association, New York, December 30, 1941. *J. Amer. Stat. Assoc.*, 37:12, 1942.



At Cornell, Prof. Clive McCay experiments with brewer's yeast, valuable supplement to war workers' diets

fully adequate diet for her husband. Therefore, as in the instance of failure to educate the public to eat whole wheat instead of white flour, it would appear entirely rational to supplement the diet—as white bread is and will be supplemented—until education can progress to the point where such supplementation no longer becomes necessary.

It would appear that the matter of using vitamin supplements in industry is, today, less a problem requiring scientific study than one requiring the application of some common sense and reasonable logic, and requiring particularly the subordination of pre-conceived views and interests to the paramount problem of increasing factory production and winning the war now.

* * * *

Our committee queried various experts as to their views on vitamin feeding of war workers. Their responses were as follows:

L. A. Maynard

School of Nutrition, Cornell University

While I would agree that the making available of synthetic vitamins to workers in war industries should be of some benefit in many instances, I do not favor such a program, mainly for two reasons. In the first place, it represents a very inadequate and incomplete nutrition program in terms of the needs of these workers. Secondly, it tends to over-emphasize the contribution to nutrition and health which can be made by a few vitamins and to cause both management and workers to give less attention to the many other essential components of an adequate diet, with a possible detrimental effect in terms of nutrition as a whole.

With respect to the inadequacy of such a program, I would point out that the vitamins which are available commercially for the purpose, are limited in number compared with the entire list of those needed by the body. Further, even if all the known vitamins should be supplied, they would represent only a fraction of the list of some forty essential nutrients required in an adequate diet. While certain vitamins are of special importance because of their widespread deficiencies in commonly consumed diets, this argument applies also to other nutrients as well. As regards the false confidence created by such a program, it should



"I don't know what made me do it—
some sort of vitamin deficiency,
maybe."

The New Yorker

be pointed out that the large amount of publicity during the past year with respect to certain vitamins has greatly over-emphasized them to the neglect of other equally important dietary factors. While certain other factors may be less important in the sense that they are less likely to be deficient in the average diet, any program which might cause the worker to pay less attention to the selection of a good diet of natural foods would result in a deficiency of some of these other factors. This result might overbalance any beneficial effects from the synthetic vitamins supplied. Further, there are undoubtedly important nutritive factors in natural foods as yet undiscovered, which might become of critical importance if the furnishing of synthetic vitamins caused less attention to be given to the selection of an adequate diet of the better foods.

It is recognized that an adequate diet can be obtained by a proper selection of natural foods properly prepared for the table. This should be the program of workers in the war industries because it would do everything that synthetic vitamins can do, and far more. It is the soundest nutrition program, educationally, and it would benefit the workers' families as well as the workers themselves. The management should see that the foods furnished in the plant cafeteria are chosen and served in such a way as to provide meals and lunches which are both highly nutritous and healthful. Studies in several plants have shown that there is a great need for improvement here and that it is feasible to bring it about. A program should be conducted among the workers and the workers' families to provide both a better diet in the home and a better lunch where carried to the plant. There may be a place for supplementary vitamin feeding in special situations in industry, but not as a general program, and not with any hope that it can be a suitable substitute for a program based upon a better diet of natural foods.

William DeKleine, M.D.

Washington, D. C.

I question the wisdom of giving synthetic vitamins indiscriminately to all workers in war industries, until it has first been tried out on an experimental basis. We need more reliable information as to how this would influence the health and working capacity of employees.

It is the general consensus that young, healthy adults do not benefit materially from taking synthetic vitamins. Not so, however, with middle-aged and older adults in whom vitamin deficiencies are more evident. The majority of them are greatly improved in health and physical vigor particularly when taking the B vitamins.

Several thousand pellagrins in the Southern states are living today because of the free distribution of brewers' yeast which is not a synthetic but a natural B complex. The present death

rate from that disease is 75% below what it was in 1927, when the yeast distribution program was inaugurated.

Frank cases of pellagra are not common in Northern states but subclinical forms of this disease and other B vitamin deficiency states are very common everywhere particularly among older people. Thousands are in poor health and unable to stand up under strain for no other reason than lack of these precious nutrients in the diet.

I am convinced that marked improvement would be made in the nutritional status of all workers in industry if a good quality of pure yeast was added to their diet. Some very palatable soup stocks can be prepared at low cost which include from 5 to 10% of yeast. Yeast is a food and should be served as such.

I emphasize yeast because it is an excellent natural B complex and is available in unlimited quantities at low cost. It contains all the factors naturally present in the B complex which is not true of the synthetic B complex products now available.

There should be no objection to inaugurating a program of including yeast in the diet of all war workers if it can be served in palatable form. I question the wisdom, however, of giving all workers synthetic vitamins until we know more about their effects through carefully controlled experiments. I understand that one or more studies of that kind will be inaugurated in the near future.

Dr. W. J. Dann

Duke University

In my opinion it is not desirable to supply synthetic vitamins to workers at industrial plants. Reasons for this include the following:—(1) It tends to focus too much attention on the vitamin content of the diet, and may engender an attitude that, provided a vitamin pill is taken, one can be as careless as one likes about what other food is eaten. This is emphatically not true. (2) Our knowledge of all the vitamins required by man is still incomplete, and of those known, only a few can be supplied as synthetics. (3) If vitamin supplements must be supplied, it is more economical to use by-products such as yeast and natural materials such as fruit juice, which also have the advantage of supplying other vitamins which would not at present be given as synthetics. (4) Above all, the experience gained in British industry through the last three years shows conclusively that an unprecedentedly high output can be maintained by attention to meals without the use of synthetics, although a smaller variety and quantity of food is available there than in the U. S. A. (5) In my judgment, a great deal of recent work emphasizing the necessity of such large intakes of vitamins has been more enthusiastic than critical. The experiments made have often been poorly designed, and have been much too subjective. Unless they can be widely corroborated and extended, they cannot weigh

against the experience of the ages, that health and strength can be maintained without the use of the synthetics.

It is my opinion that the best results can be obtained by supplying the worker with a midshift meal, as is done in British factories. The meal must be dietetically satisfactory, well prepared and served, and acceptable to the worker. Where prevailing tastes make the soundest type of meal (that based on the "Oslo breakfast") unacceptable, something nearer the local taste should be supplied at first, and then gradually modified until it is sound. In addition, at the middle of the first half of the shift a glass of fruit juice or tomato juice should be given, and at the middle of the second half, a glass of milk. These will have a valuable effect in combating fatigue, as well as helping to maintain health. Where it is impossible to supply a full meal in a canteen, then the milk and fruit juice should be supplied during the work hours. In addition a source of B vitamins would generally be beneficial; it could be supplied as dried yeast, either mixed in the milk and flavored with malt or chocolate, or added to a sandwich.

Education of the worker and his family in dietary matters is of great value; perhaps the most valuable sort of education is the demonstration to the worker of the benefits following the eating of carefully designed meals and the use of milk and other supplements supplied him at his place of work. If these things are supplied cost-free or at nominal cost to the worker, he will not need to be urged to make use of them, and experience in many places has shown that he responds with an increased feeling of well-being and with an improved performance of work. If the worker pays for his meal in a canteen, a fixed menu should be supplied each day at a given price, so that he cannot choose the cheapest (and least nourishing) items alone; the price must be such that it is obviously the best meal he can get for his money in the locality.

Walter H. Eddy, Ph.D.

*Professor Emeritus, Physiological Chemistry
Teacher's College, Columbia University*

First, let me state that I am definitely in favor of supplying war workers with multiple vitamin and mineral preparations for the following reasons:

First, all nutrition workers are agreed that it is possible to secure all the necessary vitamins and minerals from natural foods but extensive surveys have shown that the large part of the people do not know how to make such selection and are not making such selection. They are also agreed that every effort should be made to educate the people in this respect as the ideal solution of the problem.

Second, We are already adopting one expediency measure pending the attainment of the ideal by fortifying foods people like to

eat with the factors they need, for example enriched bread, vitamin D milk etc. But this movement is far short of attaining the physical efficiency we must have *now* in our war workers.

Third, as an expediency measure I am strongly in favor of using what we have available to accomplish our immediate needs and such material is available in the multiple vitamin and mineral offerings of many of the reliable drug firms today.

Fourth, I have seen the use of such supplements accomplish quick results in a number of plants and know that the procedure is effective. In one plant in particular I saw it increase in six weeks the amount of production, the reduction of spoilage and accidents, the reduction of absenteeism, and the increase of the weekly wage; results measured statistically and found statistically significant.

Professor E. V. McCollum

*Department of Biochemistry, The Johns Hopkins University
School of Hygiene and Public Health*

In my opinion it is a much wiser policy to consistently educate the public in the use of proper combinations of our common natural, wholesome foods so as to make diets which are complete rather than to rely upon synthetic vitamins.

The promotion of synthetic vitamins is on a very low level at the present, a little, if any, above the old patent medicine days.

Norman Jolliffe, M.D.

New York City

1. Dietary surveys show that the diets of a large fraction of employed wage earners are less than optimal.

2. Examinations of population groups show a high prevalence of mild-chronic nutritional deficiencies but a low prevalence of severe-acute deficiencies. Manifestations of either type of these nutritional deficiencies require therapy to an extent not likely to be obtained from food alone. It is granted that an optimal diet from conception to the grave will prevent malnutrition in most of us, but for those in whom it is already manifest diet alone will not cure malnutrition except in occasional instances and if time is no object. It is also not yet proven that the administration of poly-vitamin capsules in amounts likely to be given to these workers would constitute adequate therapy.

3. Changing the dietary habits of population groups is a slow procedure. This will require not weeks or months but years and possibly generations.

4. In this war, time is of the essence.

Therefore I recommend the routine improvement of the diets of war workers, and if the presently conducted tests in war industries prove their worth, the routine administration of adequate

amounts and proportions of dietary supplements. This program should include:

1. Education toward the selection of an adequate diet. This education should not be restricted to the war plants but also include the communities in which the workers live.
2. Adequate non-profit cafeteria facilities under the charge of a trained dietitian and supervised by the medical department.
3. A special lunch to be served in the plant consisting of all five essential groups of foods. This lunch might be designated "Victory Lunch" and subsidized in part if necessary by government or management.
4. The encouragement of milk and fruit for between meal snacks and the discouragement of candy and carbonated beverages.

Dr. F. G. Boudreau

Chairman, Committee on Nutrition in Industry

National Research Council Division of Biology and Agriculture

Natural foodstuffs must form the basis for good nutrition. It is impossible to insure an optimum intake of all the essential food factors through the use of any of the polyvitamin preparations now on the market. This is particularly true in relation to those essential factors which are not vitamins and in relation to many components of the vitamin B complex which have either not been isolated or have not been synthesized. Yeast preparations, of course, insure an adequate supply of the members of the vitamin B complex but do not account for deficiencies in other vitamins and in protein, fatty acids, minerals, and energy producing foods.

The Committee is cognizant of the fact that conditions exist in which vitamin concentrates and synthetic vitamins might be indicated. Such a situation might be one where cooking and refrigeration facilities are inadequate, transportation is poor, and living conditions are not satisfactory. Insofar as possible, every effort should be made to remedy such inadequacies. However, if they cannot be entirely corrected then the use of concentrated might be indicated. The Committee feels that irremediable situations are far from the rule and that they should be defined by the study of individual communities and plants, a study conducted by qualified individuals, before resorting to the use of vitamin concentrates.

Vitamin concentrates may also be indicated where there is a high prevalence of nutritional deficiency diseases. Here again the incidence of nutritional deficiency diseases should be determined through a survey conducted by a qualified physician.

It must be recognized that synthetic vitamins and vitamin concentrates are expedients that cannot form the basis for a sound nutrition program. In the last analysis good nutrition must be built upon a foundation of an optimum diet of natural foodstuffs.

Dr. Otto A. Bessey

*The Public Health Research Institute
of the City of New York, Inc.*

Much of the controversy over the question of supplying synthetic vitamins to war-plant personnel is due to a lack of broad understanding of the problem and the fact that one cannot give a blanket answer to cover all circumstances. The correct answer depends on the particular plant, locality, etc. It is my judgment that in general the feeding problem should be met by attempts to make available an adequate, wholesome food supply in plant cafeterias or by some other method of distribution, under the management of someone who knows the nutritive aspects of feeding and not as is so often the case, leaving this to those whose main objective is selling. Many plant managers now provide such services at cost because they realize the benefit to the management of a well nourished personnel. However, at the present time there is apt to be some difficulty in obtaining the necessary equipment for the above program. Therefore, the use of synthetic vitamins on a voluntary basis may be a worthwhile activity in certain cases. However, I feel that our present knowledge of the probable benefits of this procedure is insufficient to warrant compulsion.

Some of the objections to the use of synthetic vitamins for such purposes are (1) One is not assured of complete nutrition by this method of provision because essential nutriments including some as yet unidentified vitamins are not available in synthetic form; (2) it encourages exploitation by those who have such products to sell. I might add also that in the near future the demand for synthetic vitamins for expeditionary rations may exceed our production facilities. In such event it becomes more desirable than ever that we at home get our nourishment from food.

These are my personal views and not necessarily those of the institution with which I am associated.

Dr. Wilbur A. Sawyer

*Director, The Rockefeller Foundation
International Health Division*

Our position is that the crying need for better nutrition can be answered only with food. Giving synthetic vitamins is a stopgap procedure, of great value to some of the ill or depleted, but having little or no value for the normal working individual needing better nutrition. The well planned lunch of protective foods, with possibly a *midshift* supplement of milk or fruit juices, will do all that is needful in keeping up efficiency and health. There is no objection to using brewer's yeast in this food in any way that is palatable, and it could help by increasing

the percentage of some of the essential nutrients in the food. The use of the synthetic products, however, is advised against, and this procedure might even be *harmful unless it were accompanied by a corresponding increase in food intake.*

Prof. John R. Morlin

*The University of Rochester
Department of Vital Economics*

Regarding the use of synthetic vitamins for industrial employees it is my considered judgment that nothing further should be done to promote the use of synthetic vitamins by large industrial employers, until the results of research now in progress at several large industrial plants are at hand. I happen to know quite a little of one such project, but am not now privileged to tell you the results, as they are held in confidence until they are completed, confirmed or extended. I think in another two or three months we shall have information regarding use of these vitamins in at least one of the organizations to guide us.

There have been rather premature results reported from inadequately controlled observation in one or two large plants where it was all too evident that the manufacturer of the synthetic products was determined to make use of very brief results. This is the thing we must guard against.

War Plants Report on Vitamin Feeding

Now that we have had the opinions of the medical men, let us find out the experiences of the concerns that have provided vitamins for employees. Our Committee questioned various companies. Their responses follow.

Atlas Powder Company

Apco, Ohio

We are not giving any supplementary foods to our workers. We are, however, administering 100 mgs. of vitamin C daily to all workers handling powder. This plan was adopted on the recommendation of Dr. Faulger of the Haskell Laboratory in Wilmington who has found, through experimentation, that 100 mgs. of vitamin C daily greatly assists in the resistance of the body to nitro-amido poisonings for the reason that it stimulates the circulation of the blood. The vitamins are all distributed through our dispensaries on the various load lines in our plant. The nurses in turn distribute the vitamins to the bay leaders who see that their workers all receive one 100 mg. tablet of vitamin C each day.

We personally have never run any controls for observation in regards to the benefits from these vitamin C tablets. However, our record in regard to toxicity is so excellent that we empirically distribute the tablets and rely only on Dr. Faulger's results. We do feel that the vitamins are definitely helping our people. The distribution of vitamin C has been instituted from the time our plant first began to run one year ago.

The workers who are in contact with powder receive the vitamins. The vitamin C is purchased on bid from any reputable pharmaceutical house in tablet form. These are all charged to the various lines according to the percentage of vitamins used on the specific lines. The exact cost of each tablet varies from time to time according to the bid but they cost approximately five cents each. From our experience, which is approximately one year's duration, we feel that the vitamins have materially helped in the prevention of toxicity from powder.

We do not have any trouble in having the workers take these pills since they are supplied by the company free of charge.

Other companies practicing supplementing for small or large groups include the Loose-Wiles Biscuit Co. branch at Kansas City, Limestone Products Inc., National Electrotyping Corp., New York City; the E. W. Bliss Co., Brooklyn; Beatty Manufacturing Co., Little Falls, N. J.; O. C. Manufacturing Co., Little Falls, N. J.; New York Testing Laboratory, New York City. Many have carried on these projects for years. Some educational effort has been carried on in many of these companies—more effectively with Dugan Brothers than with any other, but the distribution of educational literature has been the least of the attempts.

Continental Machines, Inc.

Des Plaines, Illinois

Our first year of distribution of vitamin capsules was begun in December, running through March, but in the third year, 1942, we have begun to pass out capsules on the first of October. Of 350 employees, the highest number absent due to illness at any time was eight employees.

This is a far better record than we have had when no capsules were used. In fact, we have had winters when over half of the employees would be absent during the month of February. Now, in any project of this sort, we cannot say that this proves it is a wonderful thing. We can only say that indications are very favorable. We believe firmly that the cod liver oil capsules are very beneficial in building up resistance to colds, based on personal experience over a period of years. The capsules that we administer are placed in a paper cup.

From a questionnaire given to all of our employees, we had the following results: 88 per cent said they benefitted by the plan, and 5 per cent said they did not. Eighty-eight per cent commented: "No colds," or "Increased weight," or "Felt better." Seven per cent said they did not take enough to know; one said he couldn't take them because they didn't agree with him. Eighty-eight per cent wanted the plan to continue. We consider the project very well worth while.

Dugan Brothers

Newark, New Jersey

We have been working on a cooperative plan for two or three years on the feeding of vitamins to employees, in which they share part of the cost. This reached its height this year when the majority of our sales force and many of our inside bakery workers went in this plan.

We have always made it a point of giving our inside or bakery workers gratis the bread, cake, butter, coffee and sugar needed with their meals eaten in our plant. The average baker is a coffee drinker, likes fresh bakery products with butter. If he or she desires more lunch, it is only necessary to bring a little sliced cold meat or sandwich filling, but it is our experience that the average baker lunches mostly off of our products given to him.

This principle is more or less prevalent in old-time baking industry, particularly family industry such as ours. We do not know how the large commercial bakers handle this matter.

We believe that the vitamin assistance has been most valuable, especially to our sales force.

Eastman Kodak Company

Rochester, New York

The nutrition program of the medical department was started in 1922, at which time a nutrition adviser was employed because of the prevalence of gastro-intestinal upset at that time. The nutrition adviser began her work with girls from the office, but soon included factory workers as well. These employees were given milk between meals which proved to be an aid to better health. At the present time milk passes are granted to underweight employees or others who need between-meal feedings. These are issued by the nutrition adviser. A food history is taken of each individual and a record kept of his progress. However, plans are under consideration for providing milk, fruit juice, sandwiches and fruit between meals. A food truck would go to the various rooms and employees would not have to leave their department in order to get something nourishing.

Cod liver oil and vitamin concentrates have been served to groups of employees since 1927.

Since the fall of 1939, vitamin tablets have been available to employees at reduced cost. Recently we have changed to a vitamin capsule containing more vitamin B because it is believed that due to the tension and fatigue of present war conditions, this will be very helpful to many people.

Vitamin A	5,000 U.S.P. Units
(fish liver oil)	
Vitamin D	500 U.S.P. Units
(synthetic)	
Vitamin C	50 milligrams
(ascorbic acid)	
Vitamin B Complex	
Vitamin B ₁	3 milligrams
(Thiamin Chloride)	
Vitamin B ₂	3 milligrams
(Riboflavin)	
Vitamin B ₆	1 milligram
(Pyridoxine)	
Nicotinamide	20 milligrams
(Nicotinic Acide Amide)	
Calcium Panthothenate	1 milligram

A large number of our employees purchase these vitamins for the prevention of colds and excessive fatigue. They feel that they receive considerable benefit from them. Such vitamins can be obtained at a cost of from two to four cents each depending upon the amount purchased.

J-M Service Corporation

Parsons, Kansas

The supplying of vitamin tablets to those employees whose work brings them in direct contact with explosive material was instituted here for the following reasons. (1) Certain local and systemic reactions noted in T.N.T. and tetryl workers are similar to those known to have a vitamin C deficiency. (2) Patients with such reactions seem to respond more readily when 100 mgs. of vitamin C is administered daily. (3) Such a precedent has been established at other ordnance plants. (4) The apparent enthusiasm of the workers for such vitamins. (5) It is known that a large per cent of the people employed here do not eat the variety of food thought to be needed.

The vitamin tablets are given out by our first aid attendants daily as requested by the safety inspectors who distribute them. Such tablets are given only to those whose work brings them in direct contact with explosive material. Plans to determine their real value, if any, are contemplated.

We have given vitamins here continuously since production was commenced. The tablet we use has an additional 50 mgs. of vitamin C. Through a government contract these tablets are bought at a reduced price. I understand it is approximately \$16 per thousand.

In the writer's opinion, there is ample justification for the administration of 100 mgs. of vitamin C daily to employees who come in direct contact with T.N.T. or tetryl. The other vitamins included seem to be of some benefit although of course, theoretically they should not be required. Strenuous efforts are being exerted to improve the diets of our employees.

Monsanto Chemical Company

St. Louis, Missouri

We furnish and require the use of vitamin tablets at only one of our operations where the product handled is such that the men must be just a little bit better than average in their physical condition.

We have not supplied vitamins for prevention of colds or other purposes, although we have discussed the possibility at various times.

One plant manager reports that vitamins are furnished only to those men on special or skilled assignments.

The vitamin pills, which cost \$17.50 per thousand, contain:

Vitamin A	10,000 U.S.P. X 1 units
Vitamin D	1,000 U.S.P. X 1 units
Vitamin B₁	250 U.S.P. X 1 units
Riboflavin	250 micrograms (B₂ or G)
B₆	35 micrograms (pyridoxine hydrochlorite)
Filtrate factor	180 micrograms (pantothenic acid)
Nicotinic acid	7.5 milligrams

Originally, vitamins A and D were used to promote calcium absorption, therefore strengthening bone structure as an insurance against phosphorus effects. Later the various B vitamins were added to lessen fatigue and tension.

The plant has no record to prove or disprove the value of vitamins in reducing absenteeism and increasing efficiency, but it is felt that the vitamins do increase resistance to disease, especially respiratory infections, and that they also aid in calcium metabolism. There has not been any phosphorus necrosis. A number of the men to whom vitamin tablets are not supplied buy them of their own accord because they feel the vitamins increase their appetites, and many of the men say that when they take the vitamins they notice less tendency towards colds and are in better all-around physical condition.

Another of our plants supplied a different type of vitamin pill to its employes for a period of one year. These pills, which contained vitamins A and D, were used in conjunction with calcium phosphate tablets and were necessary in order to insure proper assimilation of the calcium.

The medical department at this plant was mainly interested in the effects of the calcium on the employes and no records were kept as to the other effects which might be expected from the use of vitamin pills.

National Lead Company

Brooklyn, New York

Around the year 1936 we found that many well-nourished men were hired and that they were unable to stand the usual activities of employment and they were retired or left of their own accord. At the same time we found that our regular employees were not in their usual physical condition and we studied the problem to some extent. We found that the diets were largely carbohydrate, rice, macaroni, etc.—filling, fattening food but not well balanced.

This was the result of low wages and unemployment during the preceding lean years. We therefore added a well balanced noon day meal at low cost to the employees and wholesale supply of one a day mixed A, B, C, and D vitamin and physiological minerals. At the same time we instituted much more elaborate medical supervision to our routine.

Naturally we have improved health with all these measures but it is impossible to point to any one thing as the most important factor. At this time wages began to rise and living conditions improved, so we could not even evaluate our factory dietary as a factor in the general improvement.

This experiment was started on about 75 to 100 employees and has continued since 1936 but we have discontinued the vitamins and minerals as we feel that a well balanced meal contains adequate vitamins together with the advantages of a good sustaining meal.

North American Aviation, Inc.

Inglewood, California

Although North American has assisted in the sponsorship of vitamin research undertaken by the California Institute of Technology, we have never inaugurated a controlled vitamin program in our plant. Instead, we have made vitamin tablets available to all our employees through a company store at cost, since we were convinced in advance of the value of vitamin tablets in maintaining the health and vitality of our employees.

The sale of vitamins to North American employees was begun in May, 1942. During the first four months, one million tablets were sold to employees. Our sales at the present time are approximately 12,000 tablets daily. The tablets are furnished at cost, which is 97¢ per bottle of 135 of the type we are now using.

The daily ration of the type of tablet we are now using consists of three sugar-coated tablets containing the following:

Vitamin A	5,000 International Units
Vitamin D	1,000 International Units
Vitamin C	600 International Units
Vitamin B₁	1,000 International Units
Vitamin B₂	2,000 International Units
Vitamin B₆	150 Gamma

In addition, those employees who request them are given a like quantity of supplementary mineral tablets, of which the daily ration is also three sugar-coated tablets, containing the following:

Pantothenic Acid	1,000 Gamma
Biotin .....	.14 Gamma
Niacin	10,000 Gamma

Since we have not undertaken controlled experiments in our own plant to determine the effect of these tablets, we cannot offer any conclusive evidence supporting their value. However, we are assured by our medical department that many favorable reports have been received from employees indicating that since taking these tablets, they have been free from colds, their energy has greatly increased, and their health has been generally improved.

The amount of each mineral contained in the mineral tablet is:

Iron	10 mg
Iodine	1 mg
Calcium	120 mg
Phosphorus	93 mg
Copper Sulphate	30 mg

The vitamin tablets are prepared especially for North American.

Plumb Tool Company

Los Angeles, California

According to the findings of the National Nutritional Conference headed by Mr. Paul V. McNutt, in the daily diet of the average employee there is a definite deficiency. This conference had available the greatest mass of nutritional information and evidence ever gathered by one body. As a result of that conference, the Federal Food and Drug Administration made further studies and found that the cream of our manhood—men 21 to 35—who were being drafted were suffering from nutrition deficiency. Out of the first million men called by the draft, approximately one-third were rejected because of ailments traceable to nutritional deficiency.

Applying the above statistics to our own plant, we felt that as our men were inducted into the armed forces our problems of absenteeism and production would be intensified. We decided to investigate the merits of vitamins.

We made a survey of various companies and found that a nutritional product had been formulated into a daily ration to be taken only once a day. Each daily ration is packaged individually, so vitamins may be quickly and easily dispensed to employees.

A supply of vitamins is kept by the guard at the entrance to our plant, and each employee is presented with the daily ration gratis. We carry on an "educational" program by printing articles on health, vitamins, etc. In the employee publication, "The Anvil Chorus."

We have made spot surveys from time to time, and results have indicated our employees like to receive the vitamins and most of our employees take them regularly.

As to price, the list price is five cents per daily ration, with quantity discounts available based on volume.

The Procter & Gamble Corporation

Milan, Tennessee

When operations were begun in this shell loading plant, the Ordnance Department had a regulation requiring the administration of a pint of milk in the morning and again in the afternoon to each person employed in handling TNT and tetryl. It was thought the administration of milk had some specific effect upon the prevention of TNT poisoning. The problems that would be encountered in the purchase and distribution of this milk did not seem commensurate with the value that would be received. However, it was felt that we would have to substitute something before we could be given permission to discontinue the milk administration. There was some very slight evidence that the administration of vitamins B and C were of benefit in the prevention of TNT and tetryl poisoning.

We do not believe for a moment that the administration of a supplementary vitamin pill to ordinary workers is beneficial when

those workers are getting adequate diets. It would be ideal if these diets were corrected by the teaching of nutrition of the housewives and by the provision of proper mid-shift meals in the plant. This, however, is a long range program which requires time and trained personnel. A poor substitute for this ideal program, we believe, is the supplementing of the workers diets by the administration of vitamin pills. We believe that this vitamin pill administration should be discontinued as soon as a proper nutrition program can be got well under way.

We are emphasizing the taking of vitamins only by those engaged in toxic operations. We do not have any records of controlled series of cases and, hence, cannot give any conclusion that would be of any value. At present the pill which we are using is a sugar coated pill which we have found much cheaper than the gelatin capsule. It contains the following:

Vitamin A	5,000 U.S.P. units
Vitamin D (Synthetic)	500 U.S.P. units
Ascorbic Acid	100 mg.
Thiamine Hydrochloride	3 mg.
Riboflavin	2 mg.
Nicotinamide	20 mg.
Pyroxidine Hydrochloride	1 mg.
Pantothenic Acid	1 mg.

This is a much higher content of vitamin C than is usually used. This was done because of some opinions in the medical literature that vitamin C might have prophylactic and therapeutic uses in TNT poisoning. I do not believe that this opinion rests on very solid ground. I presume, of course, that your committee will have seen the report of the National Committee on Nutrition of the American Medical Association in which the indiscriminate mass distribution of vitamins to industrial workers is condemned. Our feeling is that the committee's stand represents an ideal, but that in our local situation the administration of vitamin pills as a temporary measure to improve the diet of our workers is justifiable.

Remington Arms Company, Inc.

Bridgeport, Connecticut

For the past year we have sold combination vitamin tablets at cost to employees of this Company. Each tablet contains the following formula:

A	5,000 U.S.P. units
B ₁	200 Int. units
C	500 Int. units
D	1,000 U.S.P. units
G	40 Sherman units

In certain of our operations where the temperature and humidity are high, we have given to the employees, free of charge, tablets containing 100 mgs. of vitamin C daily.

There follows a survey of the results we obtained from the employees' purchasing vitamin tablets for the period from October, 1941, through June, 1942.

I am certain that the supplemental feeding of concentrated vitamins has been extremely beneficial.

A survey of employees taking concentrated vitamin capsules from October, 1941, through June, 1942, showed that 33 per cent of the employees at the Bridgeport Works took vitamin tablets during the above-mentioned period. Of these 44 per cent took them *daily* and 56 per cent *periodically*. The statistics on these two groups are as follows:

	<i>Periodically</i>	<i>Daily</i>
No "colds" or grippe.....	21.6%	32%
Fewer "colds" than 1940-41.....	43%	45.7%
No noticeable change.....	33.8%	20.7%
More "colds"	1%	1.4%

The following statistics were obtained from the employees regarding their opinions of the effect the taking of vitamin tablets had on their health:

	<i>Periodically</i>	<i>Daily</i>
General health improved.....	47%	58%
No noticeable change.....	52%	41%
Poorer health	1%	1%

In general, employees taking vitamin capsules state:

1. They fatigue less easily
2. Appetite improved
3. Slight increase in weight

The Sharples Corporation

Philadelphia, Pa.

Our decision to provide our men with vitamin supplements resulted from the fact that our organization has been working long hours for over two years and we felt that we wanted to take whatever intelligent steps possible to fortify them for the strain of such activity.

We were apprehensive that some of our employees would not take advantage of vitamins so we had an authority on the subject talk to our organization. We then requested the employees to turn in their names if they wanted to have the vitamins daily, and to our amazement 100 per cent subscribed to the plan. We give them to our own employees free of charge and make them available for family use at home at cost.

This program has been in force only a month and, therefore, we have no records which would be conclusive. However, many of our people have volunteered the information that they feel less tired at

night and that their general state of well-being has improved. We give them to all employees, both office and factory alike.

The vitamin which we purchase costs \$28.50 per thousand.

You may be interested to know that in addition to giving free vitamins, we give each employee, both office and factory, one pint of homogenized "A" milk each day.

Standard Oil Company of Louisiana

Baton Rouge, La.

The Baton Rouge Refinery of the Standard Oil Company of Louisiana has never embarked on a plan of wholesale distribution of vitamins to its employees as a prophylaxis against vitamin deficiency, but instead has furnished them to some of the employees only when it was found that these individuals required them. These employees are usually the ones in the low wage earners class, who would be unable to purchase these expensive vitamins. We use only the best products on the market manufactured by reputable pharmaceutical houses. The Baton Rouge Refinery has made these vitamins available to its employees for the past four or five years with gratifying results.

Trojan Powder Company

Sandusky, Ohio

It is recognized that the frequency and the severity of TNT poisoning is reduced in the case of workers who are in good physical condition. Experimentation has indicated that vitamins administered daily aid in maintaining health, and therefore increases resistance to TNT poisoning.

The adoption of multi-vitamin capsules by other ordnance plants, and particularly those manufacturing TNT, led us to similarly supply our workers (in the TNT manufacturing areas) with vitamin capsules, commencing in March, 1942. They are distributed in bulk to the superintendents who in turn distribute to the supervisors, foreman and on down to the individual.

Approximately 50,000 capsules are taken each month and about 225,000 have been used since March. The cost has been in the neighborhood of \$6,750 so far this year.

Our last capsules were made up to conform to a formula requested by us. This so-called "Munitions Plant Formula" capsule contains 100 mg. of Ascorbic Acid, which is a larger amount of vitamin C than is usually furnished. Experimentation has indicated that TNT interferes with the absorption and storage of vitamin C and that this vitamin in sufficient amounts may aid as a protective measure against poisoning by TNT hence the larger quantity of this vitamin in the formula.

Our experience with TNT poisoning has been quite satisfactory, and although we recognize that this is undoubtedly the result of

quite a number of factors, we believe that the use of the vitamin capsules is one of these factors, and has been helpful.

We also recognize that the favorable results following vitamin therapy should not blind us to the value of good housekeeping in the plants and personal cleanliness.

Our reasons for giving vitamin concentrates to the workers at our Seiple Plant were identical with those which actuated the supplying of vitamins to the workers at Plum Brook Ordnance Works. Everyone of course recognizes that an employee who is enjoying good health is a better employee than one who is ill, and there is a good deal of evidence to show that many people do not receive their full requirements of vitamins, and suffer to some extent from this lack. That the handling of certain materials, such as TNT for example, has the general effect of increasing the requirements of vitamin C seems to be reasonably well substantiated by tests which have been made on animals, and this information has in turn suggested the desirability of supplying our workers with a multi-vitamin capsule containing a somewhat increased quantity of vitamin C.

The product which we use is known as a multi-vitamin capsule, munitions plant formula, and represents a formula that was worked out by the medical departments of companies that had had considerable experience in the manufacturing, handling, loading, etc. of TNT. Each capsule contains 100 mg. of vitamin C, to supply the increased quantity of this vitamin which seems desirable in the case of workers handling TNT.

The following paragraph from a recent report which we prepared on the general subject of TNT poisoning, may be of interest:

“From the results of investigations on TNT workers in the last world war it is known that balanced meals reduce susceptibility to TNT poisoning; recent investigations indicate that deficiency in vitamins may lead to susceptibility to TNT poisoning. Experiments on animals have apparently shown that a diet ample in protein, carbohydrates and fats, and supplemented by vitamins, has the effect of reducing the tendency toward poisoning by TNT, and that the best protection from a dietary point of view against exposure to TNT is obtained when the ordinary diet, though ample in quantity, is supplemented by adequate quantities of vitamin B and vitamin C. Actually, in practice, it appears to be best to supplement with all the known vitamins.”

A Sample of Industry's Activities in Nutrition

By

*Committee on Nutrition in Industry, American Association of Industrial Physicians
and Surgeons*

Although the following questionnaire covers only sixty-eight companies, it does give an interesting picture of what our concerns are doing in the field of industrial nutrition.

Number of questionnaires returned.....	80
Reported no information.....	12
Total reporting information.....	68
I. Number of employees in organizations:	
Number of Employees	Number of Organizations
1-500.....	3
500-1,000.....	5
1,000-5,000.....	25
5,000-10,000.....	11
10,000-15,000.....	5
15,000-20,000.....	6
20,000-25,000.....	3
25,000-30,000.....	2
30,000-35,000.....	1
50,000.....	1
80,000.....	1
Number not given.....	5
	68
II. Supplemental Feeding:	
1. Does management provide any supplemental feeding between usual meal times?	
Yes.....	35
No.....	32
No answer.....	1
	68

What is provided?

- 4 Provide milk, fruit, or fruit juices
- 1 Provides soft drinks, coffee, and tea
- 1 Provides candy, nuts, and gum
- 0 Provide sandwiches, cookies, ice cream, etc.
- 28 Provide a combination of two or more of the above
 - 18 — milk, fruit, or fruit juices
 - 13 — soft drinks, coffee, and tea
 - 13 — candy, nuts, and gum
 - 14 — sandwiches, cookies, ice cream, etc.

1 Not given

At what times provided?

At all times.....	22
Mid-morning and mid-afternoon.....	8
No answer given.....	5
	35

How dispensed?

Lunch carts.....	4
Lunch counters.....	6
Vending machines.....	9
Combination of two or more of the above.....	13
No answer given.....	3
	35

2. Are vitamin concentrates given to employees?

Yes.....	6
Sold at cost.....	5
	11
No.....	57
	68

III. Eating Facilities:

1. What eating facilities are available for employees?

Cafeterias or restaurants.....	18
Cafeterias or restaurants and 1 or more other facilities.....	34
1 or more facilities other than cafeterias.....	14
No facilities.....	2
	68

2. Are the facilities operated by management or by a concession?

Management.....	31
Concession.....	27
Both.....	8
No answer.....	2
	68

If a concession, do employee organizations benefit by any profits?

Yes.....	14
No.....	18
No answer.....	3
	35

If management operated, is the management satisfied to "break even?"

Yes.....	38
No charge for means.....	1
	39

3. What proportion of the employees use the plant cafeteria or lunch service?

1- 25%	in 13 organizations
26- 50%	in 20 organizations
51- 75%	in 16 organizations
76-100%	in 4 organizations
No answer given	15 organizations

68

. How much is the average meal check?

\$.16-\$.20	in 5 organizations
.21- .25	in 13 organizations
.26- .30	in 17 organizations
.31- .35	in 10 organizations
.36- .40	in 5 organizations
.41- .45	in 1 organization
.46- .50	in 1 organization
No answer given	16 organizations

68

5. Are combination plate lunches served?

Yes	39
No	19
No answer	10
	68

If so, at what price-

\$.16-\$.20	3
.21- .25	4
.26- .30	12
.31- .35	10
.36- .40	4
.41- .45	2
Indefinite	1
No answer	3
	39

To what extent purchased?

0- 25%	7
26- 50%	8
51- 75%	5
76-100%	2
Widely	2
No answer	15
	39

6. Do you employ a trained dietitian as manager of your restaurant facilities?

Yes	18
No, but one on staff	4
No	37
No answer given	9

▶▶ 68

7. Does the plant physician have any jurisdiction over or any connection with the cafeteria service?

Yes.....	33
No.....	29
No answer given.....	6
	68

Which of the following do they include?

Soup	Potato or substitute	Salad	Bread and butter
Meat or substitute	Vegetable	Beverage	Dessert or fruit
Include all.....			7
Include all but salad.....			7
Include all but soup and salad.....			4
Include all but potato or substitute.....			2
Combination of 4 or more foods listed.....			16
Meat or substitute and vegetable.....			1
No answer.....			2
			39

8. Has any study been made of food selection?

Yes.....	27
No.....	34
No answer.....	7
	68



Milk Feeding in Industry

By Ethel Austin Martin

Director, Nutrition Service,
National Dairy Council

The National Dairy Council surveyed 245 plants which serve between-meal milk. The following article reports on this survey and points out the need for extending industrial feeding of milk.

DURING 1942, the number of workers in the nation's plants swelled to more than 17,000,000. Word comes now that during 1943, war production plants in the nation probably will have need for an additional 5,000,000 workers.

These industrial workers who produce war materials are as important to the war effort as are combat troops. Industrial workers must be healthy and strong—able to work regularly and at a rapid pace—to raise production of war materials to the highest possible level.

Employers in 245 plants representing 70 different industries located from coast to coast in 21 states were asked about their experiences in providing employees with milk during working hours.

These plant executives say milk service pays with:

Better health

Less loss of time from work due to illness; fewer gaps in production.

A low rate of absenteeism has been used as the chief criterion of good health in studies made on industrial employees. Absenteeism has been reduced strikingly in factories and offices having

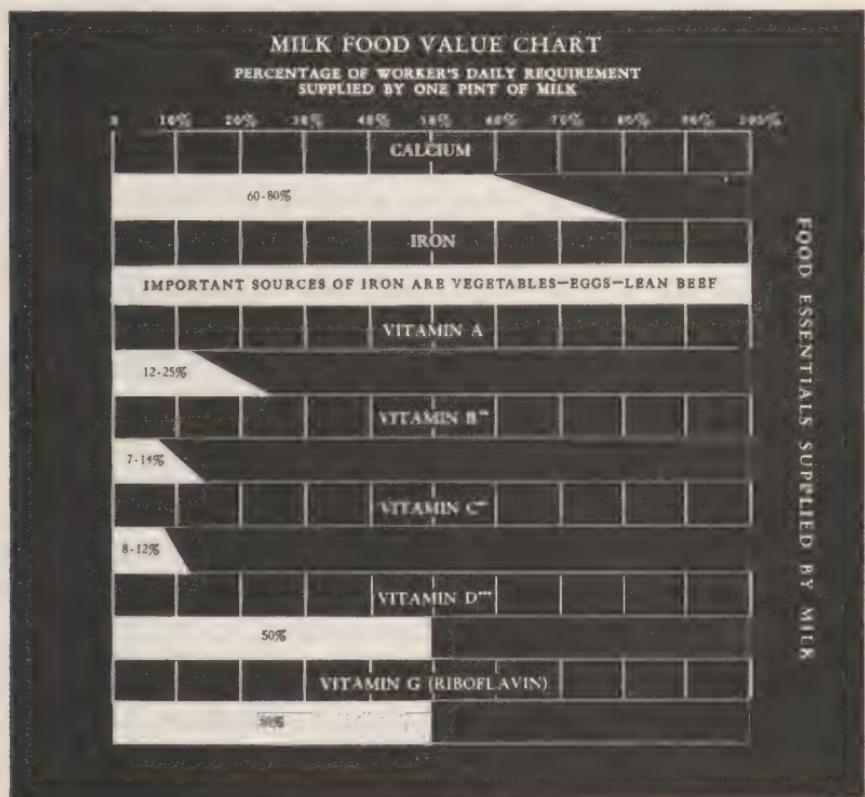
between-meal feedings consisting of milk with some other food such as bananas or cake.

Greater efficiency

No "slumps" in production schedule due to fatigue, increased production.

Studies show that muscular efficiency of workers is definitely increased with between-meal feedings of milk with certain other supplements. Results were determined by actual production records of plant operators. Efficiency of the workers who received the additional food was not only greater, but was more uniform throughout the day, than that of other workers who ate only two or three times daily.

The most striking contribution to the subject of industrial productivity has been made by Haggard and Greenberg, distinguished physiologists of Yale University. They attacked the problem of so-called "industrial fatigue" not through rest periods, but by between-meal feedings. Their tests were made under actual factory conditions in a plant making rubber footwear. Production of



The above chart relates to Vitamin D milk

individual workers was determined by counting the number of shoe tops sewed hourly by the workers under observation.

The investigators studied the effects on productivity resulting from mealtime habits in standardized groups. For this study forty operators were divided into two groups of twenty each. One group served as controls and the other as the experimental group. Their production records were studied simultaneously for ten weeks. During this time the control group ate their accustomed three meals a day while the experimental group, intermittently on two-week shifts, had mid-morning and mid-afternoon supplements of milk and cake.

The hourly average for the three-meal group was approximately 183 shoes, and practically constant from period to period. The experimental group fluctuated tremendously. Productivity increased directly with the addition of the milk and cake, the average increase ranging from 17 to 19 shoes per hour per operator during the supplementary feeding period. The authors point out that the operators in the experimental group were actually less skilled than those in the control group.

Similar, but less extensive, work of other investigators confirm the findings of Haggard and Greenberg.

Improved morale

More cheerful and co-operative attitude of employees, good will.

A study of the effects of between-meal feedings on the disposition and on absenteeism of workers was made in a large commercial office by Doctors Haggard and Greenberg. The 120 women who served as subjects were divided into two general groups, one containing 40 and the other 80 members. The larger group was given milk and bananas in the mid-morning and mid-afternoon during the five-minute rest period that was already in practice. The smaller group received no supplementary feeding but served as the control group.

Supplementary feedings are part of the daily intake of food and as such should be chosen with the same care as the food of regular meals. For this reason, milk and bananas were chosen as the foods to be used in this study.

Replies to four questionnaires issued during the period of the study established definitely the fact that the majority of the employees liked the supplementary feeding. Ninety-one percent expressed a desire to have them continued.

Seventy-six percent of the employees said that they felt better and that they were less tired and nervous during the months when feedings were given. Many of the employees commented on an improvement in disposition.

National Dairy Council Survey

Many companies are already investing in employee health services which represent heavy expenditures in time and money. Milk service is a type of investment which takes little or no capital and pays big dividends. Thousands of plants throughout the country which have used milk service every day for years bear testimony to the business value of this service.

In order to obtain a picture of industrial milk service in this country, the National Dairy Council made a recent survey, of 245 industrial plants (representing more than 192,000 employees) serving between-meal milk. Each of these concerns, located in 21 different states, was asked to describe the system used and comment on its success.

The feasibility of milk service in all localities and in every type of plant is evident from the wide variety of concerns using it successfully in all parts of the United States. Some of these establishments which have found industrial milk service of real value are: heavy industries, manufacturers of machinery, manufacturers of home equipment, food industries, printers and publishers, manufacturers of clothing and textiles.

Following are a few typical remarks which demonstrate the attitude of employees toward milk service as reported by plant executives:

All employees are in favor as is shown by their patronage.

It is an institution here now. The employees would not like to do without the milk service.

It is considered indispensable.

They look at their mid-morning bottle of milk much in the same manner in which a man looks toward his lunch hour after a good morning's work.

They are satisfied, used to it now, and would not do without it.

The value to employers of between-meal milk service is evidenced by the following tangible benefits which they have noted: Fewer absences, shorter absences, greater accuracy, increased efficiency, less sickness, less fatigue, sustained energy, more cheerful attitude, more co-operative attitude, fewer colds, generally better health, and promotion of good will.

All of these benefits of between-meal milk service result in greater production and improved employee morale. In answer to the question, "Are you satisfied that milk is beneficial to your employees?" Ninety per cent of the employers answered, "Yes."

Types of Milk Service in Plants

The three main classifications of industrial milk service are as follows:

1. The dairy delivers milk to the plant and the workers, either individually or through a representative, purchase the milk from the milkman. Of the 245 plants covered by this survey, dairies deliver milk to the workers in 39% of the plants.
2. Milk is dispensed in vending machines in 31% of these plants.
3. Milk is sold in company lunchrooms, from lunch wagons or canteens, or by other methods in 30% of the plants in this study.

Milk is available to employees throughout the day in 48% of the 245 plants; in midmorning only in 31%; midmorning and mid-afternoon, in 14%. Establishments with vending machines or lunchrooms usually have milk available all or most of the day. When a dairy delivers the milk to the workers, service is usually in the morning.

Methods of Milk Distribution in Plants

Various methods of plant milk service were revealed by the survey.

They may be grouped as follows:

Dealer sells direct to employees..... 36%

Dealer enters plant and sells directly to the workers.

Industrial Milk Service



DAIRIES DELIVER



VENDING MACHINES

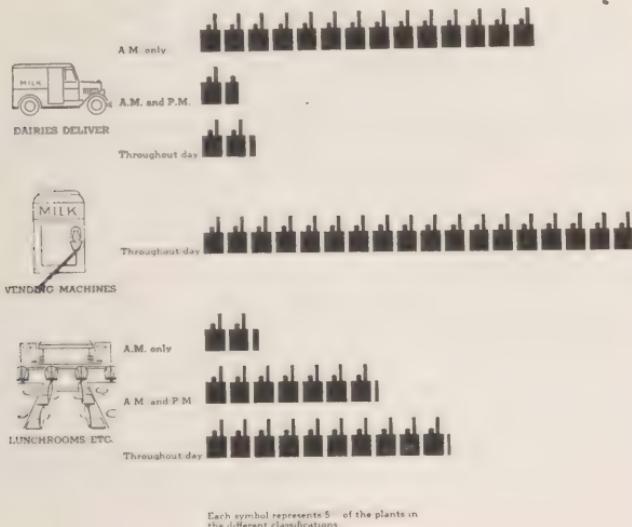


LUNCHROOMS ETC.



Each symbol represents 5% of the plants.

Availability of Milk to Workers



Organization of workers sponsors the sale 19%

In such cases the profits usually go to an employees' benefit fund.

Plant takes responsibility for milk service 18%

This includes five establishments which provide free milk for their employees.

Other plans 24%

Plant cafeterias, canteens, concessions, etc.

No answer 3%

Employees pay cash for the milk in 91% of the plants. They have credit or pay with tickets in 24% of the plants. In 2% of the plants, the company provides milk service without charge to the employees. (These figures total more than 100%, because in some plants more than one method is used.)

Milk is kept cold until used, by refrigeration in 53% of the plants and by ice or water cooling in 24% of the plants. Eleven percent of the plants use no cooling device but report that the milk is usually consumed soon after delivery.

Large Plants Endorse Milk Service

The experience of one of the country's big industrial plants emphasizes the importance of industrial milk service as a safeguard to health, stressing the growing tendency of employers to develop comprehensive health education programs in which nutrition plays

an important part. The medical supervisor of this plant reports, as follows:

"A study of absences in our plant showed approximately 15% of the employees responsible for 50% of absences due to illness. We called these individuals for a health interview and gave many of them a brief examination. This was in addition to a routine examination which all employees receive yearly. Physical defects which could be corrected were pointed out and they were urged to have treatment. A careful dietary history was obtained and when defective, or marginal, or if poor eating habits were present, these were corrected. A pint of milk daily was insisted upon as a minimum requirement.

"Next, we considered the question of improving dietary habits of the plant as a whole. It was brought out that all too frequently people on the 4 to 12 and 12 to 8 shifts were eliminating one meal a day and carrying makeshift inadequate lunches.

"Lunches carried by workers are all too frequently inadequate. Since many authorities believe large numbers of individuals who get three meals a day are on inadequate or marginal diets, it can be seen why eliminating one meal daily must invariably result in deficiencies.

"The next thing was solution of the problem of diet. We put up posters on the bulletin boards in each area and for approximately six months these posters were in front of all employees urging the consumption of more milk, butter, cheese, ice cream, etc. Exhibits, talks, and movies were used in the education program.

"I would say roughly that before this program was started perhaps twenty to twenty-five per cent of our employees were drinking milk in the cafeterias with their meals. The latest survey shows that the percentage runs from sixty-five per cent in some areas to one hundred per cent in others."

Milk served to employees between meals reduced accidents by 30 percent in the Thermod Company plant in Trenton, New Jersey. That is the estimate of Frederick E. Schluter, President of the Company.

"At this time when we are pressing hard to speed up defense production requirements, we find this free distribution of milk an important contribution," says Mr. Schluter. "The five-minute recess when milk is served is recognized as one of our best investments. The plan pays two-way dividends: to the Company in increased production and to the employees in increased incomes."

When an employee works from seven o'clock in the morning until three in the afternoon, there is usually a let-down or fatigue point around ten o'clock. Working on this theory, milk distribution was planned to hit this low point and a corresponding point during the other two shifts.

A recent check of Thermod Company records indicates a reduction in absences due to illness. The average time lost by Thermod employees through illness and accidents is nine and a half days

a year. On this basis, employees lose 13,300 man days a year and approximately \$66,500 in wages.

The favorite menu of workers in the Western Electric Company's Hawthorne plant seems to be a hot meat sandwich, a glass of milk and a piece of pie. These employees are drinking more milk and fewer soft drinks, the company dietitian reports. In January 1941 the milkman left 38,465 bottles of milk, but in October this year he left 228,348 bottles. The Company has been campaigning with simple posters and nutrition courses to increase the consumption of milk.

Milk and Lead Poisoning

For many years milk has been used as a preventive agent or cure for lead poisoning even though its effect was not entirely understood. Recent research on the subject helps to clarify its function.

Lead poisoning is considered one of the chief hazards to the health of industrial workers. In plants where lead is used even the dust is found to contain quantities of this metal. Some industrialists have found it so important to protect workers from lead poisoning that they have provided milk to employees who come in contact with lead regularly. Results of recent studies, reported in an editorial in the Journal of the American Medical Association, show that the level of calcium in the diet influences the amount of lead that may be absorbed from the digestive tract. This makes clear the reason why milk plays such an important role in the prevention of lead poisoning, for milk is the only reliable source of calcium in the diet. If plenty of calcium is included in the daily meals it tends to protect the body from absorption and assimilation of the small amounts of lead that enter the digestive tract.

Scientists Recommend Milk For Workers

Nutritionists, physicians, industrial personnel directors, and government authorities all stress the great nutritive value of milk. A typical recommendation is the following statement made by Dr. Lela E. Booher, Bureau of Home Economics, U.S.D.A., before the Second Annual Congress on Industrial Health of the Council on Industrial Health, American Medical Association:

"The popular excuse of many adults for evading the use of milk is that it makes one fat. A pint of milk carries approximately 300 calories and no flight of the imagination is going to make it any greater. A pint of milk is no match for calories as compared with most customary desserts. There would be no better way to improve the nutritive state of industrial workers than to see to it that each one gets at least a pint of clean pasteurized milk a day."

The Bridgeport Lunch Box Plan

By Beatrice Hall Kneeland
Coordinator, "The Bridgeport Plan"

A practical demonstration of what can be done to improve the nutritional status of workers took place in Bridgeport, Connecticut, where a concerted drive was made to teach housewives to "pack a lunch a man can work on." The following report outlines the organization and administration of "The Bridgeport Plan."

THE "Bridgeport Plan" was inaugurated in the industrial city of Bridgeport, Connecticut, to teach women how to pack adequate, nutritious lunches for their worker-husbands. Industrial, municipal and civil groups aided in a coordinated effort to "Pack a Lunch a Man Can Work On." Briefly, these are the highlights:

Bridgeport presented a peculiar problem in that it is composed of a great variety of nationalities. Studying the government's aim of "Make America Strong by Making Americans Stronger," Mr. Ronald A. Maloney, executive of the Bridgeport Gas Light Company, wondered how this challenge could be applied to Bridgeport's 70,000 war workers. From Miss Betty Stafford, Home Service Director, he heard that women attending classes frequently inquired about packed lunches, and he hit upon the idea of trying to improve workers' health by giving them better lunches. A quick unofficial survey of plants convinced him his idea was sound; some plants



"Pack a Lunch a Man Can Work On" was the theme of the Bridgeport plan

had cafeterias but these were of inadequate size, so most workers in the city carried their lunches from home. These lunches were usually inadequate and nearly always were depressingly monotonous and unappetizing.

The slogan "Pack a Lunch a Man Can Work On" was devised and a leaflet was prepared, suggesting efficient ways of planning and packing foods, and listing about 100 foods that might be used for lunches. Requirements for a "Five-Star Lunch" were set forth as:

★Plan it the day before. Buy or cook enough food for your dinner so there'll be some left over for the lunch box.

★Have all food and equipment conveniently stored in one place, so the lunch can be packed quickly in the morning.

★Wrap all dry food in wax paper; pack puddings and salads in paper containers with lids and include paper "hot-drink" cups for hot dishes.

★Put into the lunch box every day:

Milk. In food or drink.

Bread. Whole wheat or enriched.

In sandwiches, puddings or meat loaves.

Meat or cheese or eggs or fish. In sandwich fillings, salads, or in hearty main dishes.

Fruit. At least one, plain, or in salads or puddings.

Vegetables. At least one, in sandwich fillings, salads, or in hearty main dishes.

★Clean and air the lunch box and vacuum bottle every night.

Arrangements were made with paper cup manufacturers to assure an ample supply of paper cups and containers so that foods such as salads and puddings could be packed in lunches. Aside from the main point that such foods can be easily packed, carried and served in paper cups and containers with lids, was the fact that some plants forbid the carrying of glass and other breakables because of the possibility of sabotage or accidents.

Shortly after the "plan" was initiated, its significance as a community project was realized and it was officially sponsored by the Health Council Civilian Defense Committee, of which Dr. Joseph H. Howard is chairman. Packed lunch demonstrations were given at the Nutrition Center in the Gas Company.

Next, the invaluable cooperation of the *Bridgeport Post* was secured. The "Plan" was accepted by the newspaper as a community project of possible far-reaching consequence, not as a "publicity stunt".

Principal activities of the "Plan" as it got under way were three. In the brief outline below, it will be seen how many existing

resources of the community cooperated to make the "Plan" a success.

The main activities were:

1. **A survey of workers' lunch habits.** This was the first-known, large-scale attempt to find out the what, where and how of workers' lunches. Miss Dorothy Mohr, in whose Volunteer Registration Bureau are registered 4,000 women for any necessary volunteer work in the city, offered her registrants to do the surveying. One hundred women were chosen to work under the direction of Mrs. Andrew R. Smith, civic leader. The survey was done on a door-to-door basis in four carefully-chosen zones of the city. With a goal of 1,000 completed questionnaires, the survey closed after two weeks with a total of 859. Results show that of the total number interviewed, 817 or about 90% pack one or more lunches for workers. About half the women pack beverages and 50% of the time it is coffee. Only 276 women include fresh vegetables in lunches and only one-fourth sandwiches of whole wheat or enriched bread. Jelly was found to be a popular sandwich-filling.

2. **Demonstration work.** Before demonstrations on planning and packing nutritious lunches could be given women had to be found who were prepared to teach such classes. Classes to train instructors were organized by Mrs. Carl W. Gade, chairman of the sub-committee on nutrition of the Civilian Defense Committee and conducted by Miss Stafford. The women attending, in many cases, were graduates of nutrition courses of the Red Cross and Civilian Defense Committee and this "gave them something to do" with their new knowledge. After four or five classes, two sessions of which were devoted to demonstrations by each member, with class criticism, the pupils were graduated. A long list of "dates" for classes requested by women's clubs awaited them. Thereafter an average of about 200 women a week were being taught, in clubs throughout the city, how to plan and pack healthful lunches.

3. **Newspaper publicity.** The "Plan" was officially launched with a report of it in the "*Post*" by Ira V. Hiscock, Professor of Public Health, Yale University School of Medicine, who was undertaking a health survey of Bridgeport.

Introductory stories for the first two weeks dealt mainly with expressions of approval for the "Plan" from Mrs. Roosevelt, Mr. McNutt, Mr. M. L. Wilson, Miss Mary I. Barber and others, as well as local labor leaders. On Sunday, beginning the third week, the first "Kitchen Soldier" was introduced. Her lunch box menus for each day, discussed and criticized by Miss Helen L. Clark, Chairman of Fairfield County Nutrition Committee, were published on Wednesday and Friday, with a round-up on Sunday, when the

next week's "Kitchen Soldier" was introduced. News stories, as they developed, supplemented the "folksy" reports of the "Kitchen Soldiers."

Answering the women's statements that their husbands rarely liked "what's good for them", the demonstrator asked, "Why don't you try, just once, slipping in a salad or some chopped vegetables? You may be surprised, frequently these innovations score a sure-fire hit. If you use these little paper containers with lids you can pack a lot of things you never could pack before. How about a salad, an orange peeled for time saving, or a pudding?"

The next night one lecturer was doing the same thing at the Falcon Club, another at the Jewish Community Center, and still another at the Hungarian Reformed Church.

"Kitchen Soldiers" on the March

Through the columns of the *Bridgeport Post* a growing brigade of "Kitchen Soldiers", women who agree to modify the lunches they pack to include, every day, milk, fruit, vegetable, bread (whole wheat or enriched) and meat (or its substitute), tell other women how to make Slovakian spinach soup, American pineapple tapioca, hearty Italian sandwich fillings of eggs, green peppers, tomatoes. Along with these recipes for foods that families eat and like, was included some education, by Miss Clark as she discussed the menus and recipes.

Here, then, is a hasty close-up of the much-discussed Bridgeport "Plan" in operation. What is this "Plan"? To the women of Bridgeport it concerns simply food that, they are told, will make their men-folk stronger, healthier, and happier. Officially the "Plan" aims to improve the nutrition of war workers, yet even this objective is understandably expressed in the slogan, "Pack a Lunch a Man Can Work On". The "Plan" has a specific, not a general application. The focal point of interest is the lunch box that every woman knows about. It has, a warm, human, personal appeal not engendered by talk of any other form of industrial feeding nor of general nutrition. Through the "Pack a Lunch" campaign, women's concern about nutrition is sparked. Then, it has been seen in Bridgeport, nutrition becomes "food that make men strong"; deficiencies are something women get indignant about over the back fence!

Thus, in its broadest terms, the "Plan" is a concrete program by which the tenets of nutrition are voluntarily translated into action in American kitchens. National leaders who for a year have urged the need for better nutrition recognize, in this community-conceived "Plan", the answer to their absorbing dilemma: "It is all very well to *talk* about nutrition but how are we going to get Mrs. Johansen and Mrs. Smythe and Mrs. Sletkovich to *practice* it? How do we know our talk is even reaching them . . . their consciousness?"

So startlingly simple yet effective was the answer, as developed in Bridgeport, that within a month after its inception, such national leaders as Mrs. Eleanor Roosevelt, the Hon. Paul V. McNutt and others had approved it and were urging its adoption in other cities. Dr. R. S. Goodhart, of the Committee on Nutrition in Industry of the National Research Council, had made a special trip to Bridgeport to see at first hand the operation of the "Plan" which "we are hearing so much about", and within a week Dr. Elmer Alpert had been sent by the committee to start an investigation aimed at making Bridgeport the "test city" where all the recommendations for improving the nutrition of war workers would be set in motion. Cities all over the country wrote for advice in setting up similar programs. Bridgeport, thus, is like a great test tube where a formula for improving the diet of war workers, and, therefore, of Americans at large, is being developed. Through publicity, the reactions—the first bubbling antagonisms, the ultimate harmony—are plain for all to see and profit from. The "Plan" began to be used as a basis for study in sociology and nutrition classes in several colleges.

The "Plan" Is Successful

Most dramatic, to leaders of the "Plan", was the way in which early antagonisms, manifested by the public, gave way to an almost irrepressible enthusiasm which, often without any direct prompting by leaders, sprang up in many quarters of the city. The inevitable resistance to change was first expressed by such comments as these . . . "Anyone would think this is Germany. Now they're going to tell us what to eat!" "Nobody's going to tell me what to put in a lunch . . . I've been packing lunches for twenty years!" This attitude was immediately combatted by newspaper and radio publicity and through churches. It was emphasized repeatedly that the "Plan", and the survey in particular, was "constructive in its purpose". The day before the survey started, pastors announced it from their pulpits. A letter from Mrs. Roosevelt, praising Bridgeport women for the "Plan", was run on page one of the *Post*. Results were gratifying: Interviewers, reporting a fine reception, said that in many cases they were expected by housewives and were frequently greeted with the comment, "Oh yes, this is what Mrs. Roosevelt said we should do. . . ." There was ample evidence that women are already beginning to *think* about food. Some comments were: "Why can't men drink tomato juice or milk in the plants instead of soft drinks? . . . just think of all the vitamins they'd get by the end of the day!" . . . "Why can't men have longer lunch periods? . . . fifteen minutes isn't long enough" . . . "There ought to be someone who knows about food in charge of cafeterias at plants" . . . conclusions, reached on their own, that dovetailed perfectly with recommendations of scientists for industrial feeding programs:

From then on the "Plan" almost carried itself forward. Word reached leaders that stories on the "Kitchen Soldier" were being

used for study in a food class at a local high school. At the end of the term an examination was held with students applying lessons in nutrition to the job of planning and packing lunches for workers doing various kinds of labor.

At demonstrations, any initial skepticism vanished as instructors, interspersed simple instruction regarding nutrition with ideas about cooking or preparing food and with tips to lighten work. The unanimous reaction is described by one instructor. "Their delight is unbounded. . . . The most enthusiasm comes when we show them how many desserts, such as custards, tapiocas, stewed fruits, etc., can be easily carried in the lunch box by packing them in paper containers with tight-fitting lids. The money-saving practice of draining canned fruits and packing them in these paper containers, when fresh fruit becomes prohibited in price, which we suggest, is always a hit. . . ."

Bridgeport, in short, is becoming a city converted. Over and over again "Kitchen Soldiers" report, "I had to pack more carrot and celery sticks in my daughter's lunch . . . the other girls at the plant want them, too" . . . "The men working near my son used to laugh and say 'More rabbit food' when my son opened his lunch. Then they tasted his raw carrots and now all those men have made their wives put raw carrots in their lunch boxes."

Isn't this an answer to those who might have scoffed, "It can't be done"? Bridgeport, city of many languages, of diverse customs rooted in distant lands, proves it can.

BRIDGEPORT LUNCHBOX SURVEY

1. How many lunches do you pack every day for members of your household? (1).
One.... (2) Two.... (3) Three.... (4) Four.... (5) More than four....
2. IF YOU DO NOT PACK LUNCHES, where do workers in your household buy lunches? Plant Cafeteria? (1).... Tavern? (2).... Box Lunch Stand? (3).... Milk Bar? (4).... Mobile Canteen? (5).... Other? (6)....
3. What do you use for packing? Metal Box (1).... Paper Bag (2).... Paper Box (3).... Other? (4)....
4. Check foods included generally in lunchboxes you pack: Sandwiches (1).... Cake or Cookies (2).... Raw Fruit (3).... Cooked Fruit (4).... Raw Vegetables (5).... Cooked Vegetables (6).... Salads (7).... Puddings or Pie (8).... Soups (9).... Stews (10).... Other Hot Foods (11).... Other Foods (12)....
5. Check kinds of Bread used in sandwiches: Whole Wheat (1).... Rye (2).... Enriched White (3).... Plain White (4).... Nut (5).... Fruit Bread (6).... Cracked Wheat (7).... Brown Bread (8).... Other (9)....
6. Check kinds of fillings most frequently used: Sandwich meat (1).... Cold Roast meat (2).... Cheese (3).... Vegetable (4).... Fruit (5).... Egg Salad (6).... Fish Salad (7).... Peanut Butter (8).... Jelly (9).... Other (10)....
7. Do you use paper containers in the lunchbox for packing Salads? (1).... Puddings? (2).... Other foods? (3).... For serving hot foods carried in vacuum bottles? (4)....

8. Do you fill a vacuum bottle for each lunch you pack? (1).... If so, does it contain soup? (2).... coffee? (3).... stew? (4).... other hot dish? (5).... cold drink? (6).... Other? (7)....

9a. Do you pack all the lunch the worker eats? (1).... Or does he buy additional foods at the plant? (2).... At a nearby restaurant or tavern? (3).... Milk Bar? (4).... Candy stand (5).... Lunchbox Concession? (6).... Other? (7)....

9b. What foods do they buy to supplement carried lunch: Milk (1).... Dessert (2).... Candy (3).... Other Beverage (4).... Other Food (5)....

10. Do you get foods ready for packing the lunchbox the previous night? (1).... or make all preparations in the morning? (2).... Is worker on night shift? (3).... or day shift? (4)....

11. Do you include supplies for the lunchbox in planning regular meals? (1).... Or buy special foods to use for packing lunches? (2)....

12. How would you classify type of work done by those for whom you pack a lunch, such as strenuous? (1).... moderately active? (2).... sedentary or desk work (3)....

ADDRESS OF WOMAN INTERVIEWED.....

NAME (IF WANTS TO ATTEND CLASSES).....

TIME WOULD LIKE CLASSES IF INTERESTED.....

SIGNATURE OF INTERVIEWER.....

Labor and Nutrition

What is the attitude of labor toward the nutritional program? Our Committee sought an expression of viewpoint from the leaders of organized labor on this question. Labor's attitude, as shown by the following statements, is one of approval and cooperation.

American Federation of Labor

WILLIAM GREEN, *President*

For more than sixty years the American Federation of Labor has worked for higher wages in order to have a higher standard of living and wider and more continuous educational opportunities to make better use of the homes of work and the homes of recreation. Labor well knows that nourishing food is essential to physical and mental well being and it is as important as medical care in maintaining physical fitness. Health to a wage earner means ability to earn his income and to assure his self-dependence.

The Federation welcomes the interest of the scientists and medical practitioners in the field of health of workers, and hopes that these interests will be translated into simple practical information that will serve as a guide for our food habits. We would welcome the cooperation of employers, who could help to make the most nutritious food available during work-hours, and with the help of the scientists, we shall be better able to select food for our own tables.

We are glad to welcome a new source of help in securing more abundant life for the millions who work.

Congress of Industrial Organizations

PHILIP MURRAY, *President*

The health of the workers of this nation must be fully maintained if the guns and tanks, shells, airplanes and ships that they produce are to reach the battlefronts of the world.

Nutrition plays a vital role in maintaining the health of the American workers. Every effort should be made to see that the best information on it is disseminated among all the people of this country.

The facilities of the government agencies dealing with nutrition should be placed at the disposal of local union committees throughout the country. For through this source the information reaches the workers directly.

Canteens and restaurants following the best practices of nutrition should be in, near or in close proximity to all industrial plants.

Many labor organizations are already active in promoting nutrition programs. As the days go on, more and more interest in nutrition is shown by organized labor. The CIO hopes that greater consideration will be given to this subject than has been received in the past.

***Joint Statement by New York State Federation of Labor
and New York State Industrial Union Council***

THOMAS J. LYONS, *President*

GUSTAVE A. STREBEL, *President*

Organized labor recognizes the role of nutrition in improving the health and well being of the workers who are producing the guns, planes, tanks and ships vital to victory. Labor believes that nutrition can help cut down illnesses which reduce the income of employees. Organized labor wishes to encourage the work of the many nutrition committees operating in cities, towns, counties and villages throughout our country. Many unions are already imparting information on nutrition to their members; more will do so. Lack of factory canteens in many war plants has made it difficult for workers to get proper foods. Organized labor has consistently supported all efforts to improve factory conditions and fought for improvements in the field of industrial hygiene. We believe that the nutrition of the worker merits greater consideration than in the past.



Distribution of surplus foods aided persons on relief rolls to secure a balanced diet

Operation of the Stamp Plan

By Norman Leon Gold

Assistant to the Administrator
Agricultural Marketing Administration

When the bells tolled the end of 1942, they also marked the end of a unique plan for the distribution of surplus foods to needy families. The following articles by Mr. Gold and Dr. Harvey were written shortly before the Stamp Plan was abolished by Congress. But they are so important in their implications that their publication in this report seemed entirely worthwhile. These articles put squarely before us the question: What must we do to assure an adequate diet for our low-income groups, who are not receiving boom-time wages?

THE Food Stamp Program was developed originally to move surpluses of agricultural commodities into consumption by increasing the effective demand of low income families, and thus raising farm income. It was a broad approach to the "paradox of the thirties"; that is, farmers could not afford to market the products that needy people could not afford to buy. Examination of purchase habits and potential consumption of low income people, indicated that with the exception of a few staple crops, the real agricultural problem was not surpluses that could not be utilized, but rather under-consumption by a major part of our population.

Since that time, national income has increased, and demand for agricultural commodities has skyrocketed. We are in a period in

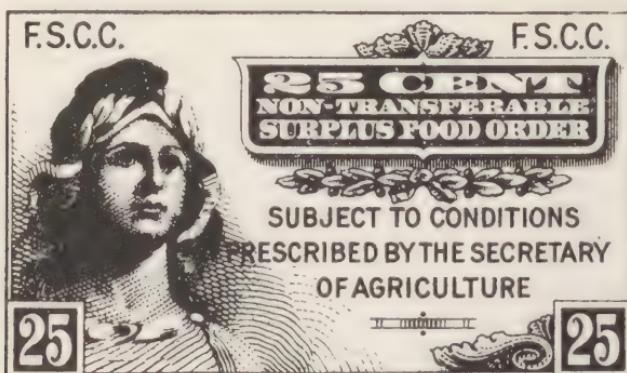


Items at the back represent customer's regular food purchases, paid with orange colored stamps. Foods in center are surplus foods obtained with blue stamps given free. Items in front are not foods and were bought with cash

which more and more consumer rationing is necessary because the amount of food that employed persons with higher incomes would buy far exceeds the short-time productive capacity of our agricultural and processing plants. Obviously this necessitates consideration of the place of such a mechanism as the Food Stamp Program in the war period and raises questions about whether it should continue.

People in low-income groups need more of almost everything—more food and clothing, better shelter, and medical services, increased resources for transportation, greater expenditures for recreation. They are budgeters carrying the science to a high degree of perfection by making inadequate resources do the job of meeting, at least partially, very pressing needs.

The Food Stamp Program was designed to do a special job—to increase the expenditures of unemployed low-income families for food. It began in Rochester, New York, in May 1939, and after experimental studies in five other cities, the Department of Agriculture began to expand it rapidly. In December, 1939, 400,000 people were taking part. By December, 1940, the number reached 2.8 million people, and



This stamp was good for purchase of 25 cents worth of certain surplus foods.

by December, 1941, 3.5 million people. The peak was reached in May, 1941, when 4 million people took part. After that the number declined so that by September, 1942, the participation totaled 2.3 million persons.

The decline in participation did not represent a withdrawal of the program from any areas, though it has not been expanded to any considerable extent for about a year. The decline in participation in the areas where the program was established reflected the decrease in eligible families which resulted from improved national employment and reduced relief rolls, as well as an extensive program of recertification of all cases to check continued eligibility and need. By September, 1942, the program had been established in 1,471 counties and 88 city areas--territory containing approximately 62 percent of the Nation's population.

Nature of Operations

Under the program, state and local public welfare departments certify needy families receiving or eligible to receive public assistance. In a few areas "border-line" cases, families just at the accepted income level for public assistance, have also been included. These families are permitted to buy orange-colored stamps at face value, but at the same time receive a certain amount of blue stamps free. These two types of "special currency", issued in 25-cent denominations, are used to purchase food in retail stores. The orange stamps may be used to buy any food; the blue stamps are exchanged for designated foods placed on a special blue stamp commodity list issued monthly by the Secretary of Agriculture. Retailers then paste the stamps on cards and redeem them through their wholesalers and banks, or directly through the Agricultural Marketing Administration.

The blue stamp commodity list has not been changed greatly during the life of the Food Stamp Program. Eggs, fresh vegetables and fresh fruits in season, and dry cereal products have always been on the list. Pork and butter have been on the list much of the time, though not in recent months. The demand for many of these commodities has been smallest among low-income families, despite their great nutritional value.

Each eligible family now spending between 5 and 7 cents per person per meal for food, on the average, invests this amount in orange stamps and receives an additional $2\frac{1}{2}$ to 3 cents in blue stamps. The family gets more food, buying it at the local store. And the farmer has a better market for agricultural products. That, in essence, is the Food Stamp Program.

Who Takes Part

The following estimate of 1942-43 participation in relation to the number of eligibles has been prepared by the Agricultural Marketing Administration, which is responsible for the operations of the program.

CATEGORY	Estimated average number in 1942-1943	Stamp program participants	Per cent of total
	Thousand persons		
Old age assistance.....	2,285	450	20
Aid to dependent children.....	1,371	550	40
Aid to the blind.....	80	20	25
General Relief.....	1,705	600	35
W.P.A.....	1,575	300	19
Other Federal.....	50	10	20
Non-Assistance.....	1,250	300	24
Total.....	8,316	2,230	¹ 27

¹ The Direct Distribution Program had 1,994 thousand participants, so that 51 percent of eligibles received A.M.A. foods.

The startling fact is that there are still 8.3 million persons eligible. The number has declined materially since 1933, but is still very large. (See Figure 1). Detailed studies conducted by the Agricultural Marketing Administration indicate that their average family income is less than \$50 per month. Approximately one-sixth have incomes under \$20 per month, and two-thirds actually have incomes of less than \$60 per month. In 1942, many are able to spend only 3 to 5 cents per person per meal for food, and only a few spend as much as 8 to 11 cents.

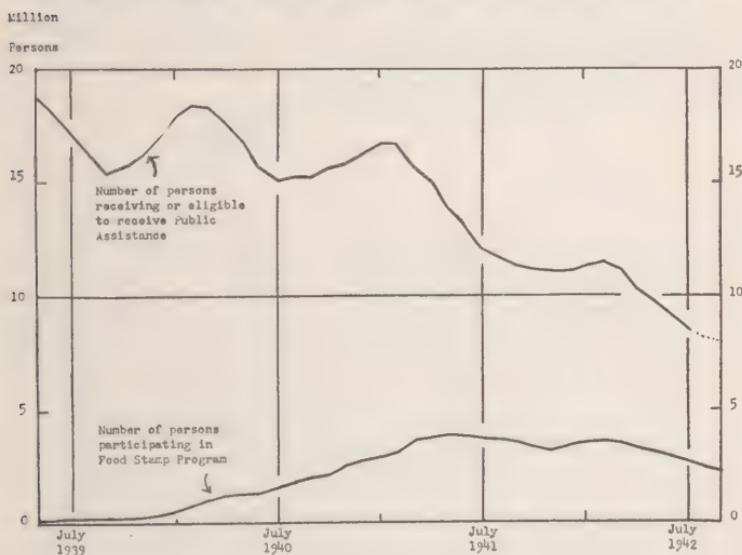
Among the groups now participating are about 300,000 persons getting no other type of assistance. Most of these are in the South, a few are in Northern States, including border-line families whose income status is just about the same as many of the relief families. Recent estimates indicate that there are many of these not eligible for the program. **The O.P.A. has calculated that even with the record national income of 1942, about 6 percent of all families and single consumers will have an income of less than \$500 per year; 21 percent will have incomes of less than \$1000; and 40 percent, incomes of less than \$1500 per year.** In other words, 4 out of every 10 household units, still have a monthly wage of less than \$100 per month.

Moreover, wide disparities in per capita consumption still exist. The Bureau of Agricultural Economics has estimated per capita consumption by income groups for 1942. The groups with incomes under \$500 per year are eating less than 2/3 of the meat eaten by families with \$1000 to \$1500 per year. The people with incomes of \$2000 to \$3000 per year are eating 20 to 40 percent more than the \$1000 to \$1500 group, and the people with incomes over \$5000 are consuming 63 percent more meat and over 3 times more poultry. A similar situation exists for most other commodity groups, with the consumption by lowest income groups of dairy products

and fruits even further below the average than is indicated for other families. (See Figure 2). Studies made by the Bureau of Home Economics and the Bureau of Labor Statistics indicate that in 1941 as in 1942, families with incomes of less than \$2000 per year—fully 40 percent of our families in 1942—are not spending and probably cannot spend any more money for food now than they were able to in 1935-36.

FIGURE 1

Number of Persons in the Continental United States Receiving or Eligible to Receive Public Assistance, and the Number of Persons Participating in the Food Stamp Program, by Months, May 1939-September 1942



During the past three years the number of persons in the continental United States receiving public assistance declined from 18 million to a little over 7 million. An additional .9 to 2.7 million persons who were certified as eligible to receive public assistance but were not actually receiving it have participated in AMA domestic family food programs during this period, the total in this group falling below 1 million persons only during the last three months shown on the chart.

In July, the latest month for which complete data are available, the 7.5 million persons comprising the public assistance load included 2.3 million persons receiving old age assistance, 1.3 million recipients of aid to children, 79,000 blind persons, nearly 1.8 million persons in the General Assistance category, 2 million persons supported by WPA wages, and about 50,000 receiving Farm Security

subsistence payments or in other small groups. In addition, about 1.3 million persons were certified as eligible to receive General Assistance or WPA employment, but were not actually receiving either. This total of 8.8 million persons in July may be compared to an estimated total of 8.3 million persons in September, the decline resulting chiefly from the reduction in WPA employes. This latter total will probably be about the average for the current fiscal year ending June 30, 1943.

During the three years during which the Food Stamp Program has been in operation, it has extended its coverage to persons receiving or eligible to receive relief until approximately one-third of the total are currently participating in this program. In addition, approximately 25 to 30 per cent of the total potential is served by the Direct Distribution Program so that about three-fifths of the total number of persons actually receiving or eligible to receive public assistance are served by the two AMA family food programs.

The Orange Stamp Formula

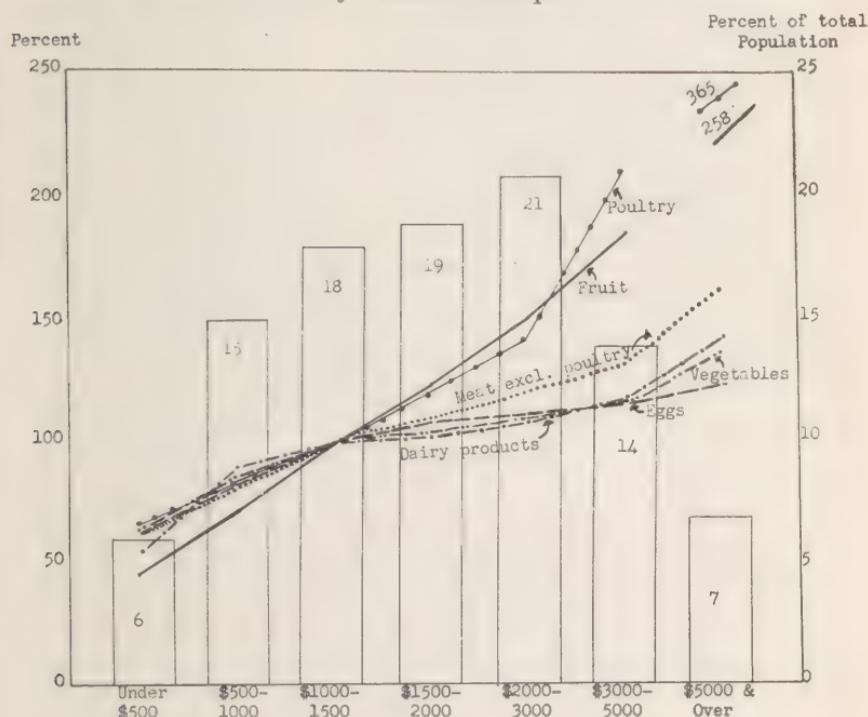
In terms of the special objective of the Food Stamp Program—to increase food consumption—the orange stamp issuance rate is the heart of the program. If each family purchases orange stamps in an amount equal to their normal food expenditure, then it is clear that the family continues to maintain its regular food budget, and the blue stamps represent a net addition to that. On the other hand, if the families were to receive cash or commodities directly, there is a great likelihood that they would simply substitute part or all of this for their normal food expenditures and thus increase their purchases of other commodities rather than food.

It is for this reason that continuous study of food expenditures by the eligible families has been undertaken, and substantial revision of the stamp issuance formulas is undertaken from time to time. In most areas, an income basis of issuance has been established. Based on detailed studies, the probable purchases for each family size and income group (\$10 to \$20 per month income intervals) have been established as minimum and maximum orange stamp formulas. A schedule of free blue stamp issuance is established for each purchase of orange stamps.

In New York City where approximately 313,000 are taking part in the program, a satisfactory orange stamp formula has been devised. A study of food purchases in New York City in early 1942 revealed that 85 percent or more of the normal food expenditures of participants were maintained by the orange stamp requirement. It also appears that 80 percent of the blue stamps distributed in New York were spent for blue stamp food which would not have been purchased in the absence of the Food Stamp Program. Actually, families participating in the program in this city were found to be spending between \$17 and \$37 per month more for food than non-participants who were also eligible.

FIGURE 2

Index of Estimated Per Capita Consumption of Foods During 1942 by Income Groups



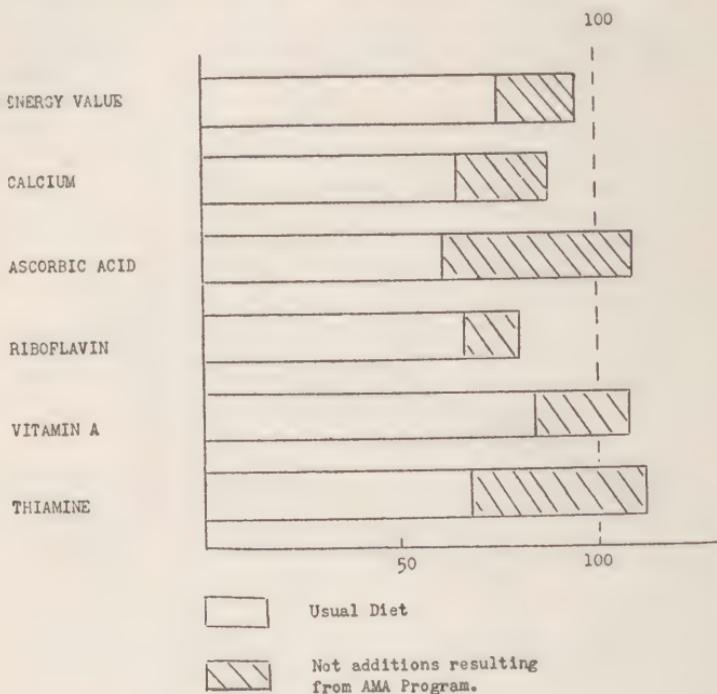
Improving the Diets of Participating Families

During the 12 months ended June 30, 1942, the low income families receiving stamps spent 16 percent of their blue stamps for eggs, 11 percent for butter, 20 percent for vegetables. By September 1942, with butter and pork products off the blue stamp list, the funds were used to buy over 4 million dozen eggs in that month (25 percent of the blue stamp expenditure) 38 million pounds of cereals (23 percent of the funds) about 62 million pounds of vegetables (42 percent of the funds) and 14 million pounds of fruit (10 percent of the funds).

Studies among low-income families indicate that their normal diet is well below national standards as established by the National Research Council (See Figure 3). The Food Stamp Program has made outstanding dietary contributions by raising the Vitamin A, Thiamin and ascorbic acid content to the safety level, as well as providing increased quantities of all other nutrients. The diets continued to need further reinforcement in riboflavin and calcium, which can be secured most economically by greater consumption of milk solids.

FIGURE 3

The Influence of the Food Stamp Program on Diets



This chart derived from estimates based on studies made in 1940 by the Bureau of Home Economics illustrates the important contributions that the Food Stamp Program is making toward improving nutritional levels among participating families. The dotted vertical line represents the yardstick for nutrition recommended by the National Research Council. The unshaded section of each bar is the proportion of the recommended allowances obtained in usual diets of low-income groups receiving public assistance; the shaded sections are the additions derived from increases in blue stamp and other foods as a result of the Food Stamp Program. The outstanding dietary contributions of the Food Stamp Program in 1940 was to safeguard diets in Vitamin A, thiamin and ascorbic acid, as well as to provide increased quantities of all other nutrients. The diets needed further reinforcement in riboflavin and calcium.

The Future of the Food Stamp Program

Like the school lunch program and direct purchase and distribution of products to needy families, the Food Stamp Program was begun originally to stamp out the surpluses. But today we are concerned with scarcities and shortages. Three factors explain this: 1. increased food requirement of the military forces of all the United Nations, 2. our efforts to meet some of the needs of the civilian population in the war zones, and 3. the greatly increased domestic demand which has developed with rising pay rolls. Record agricultural production has not and cannot keep pace with total demand. The agricultural problem has changed greatly in three years. **Can the food stamp program fit into this new situation? It seems clear that it can.**

True, national surpluses have generally disappeared. But we still have some—apples during the past harvest season, cabbage now in the late producing states, local surpluses of other vegetables, and the chronic wheat surplus. One of the war time jobs is to see that these food supplies are used by needy people.

Agriculture's biggest job is to obtain maximum production of foods to meet war requirements. For dairy products, meats, vegetables and oil crops, we are trying to get record production. The Food Stamp Program has a job here too. Through the purchasing power that needy families are given in the form of blue stamps, the farmers are assured of prices that will make it possible for them to produce at their maximum capacity and assures them of markets for all they produce. On the farm front, then, the new job is to assist in the achievement of agricultural production and price support goals, so that military, lend-lease and civilian requirements can be met.

In terms of the problem of needy people, the situation has changed as well. There are fewer of them fortunately, but their needs are even greater. Since 1940 the cost of living has increased about 18 percent with food prices increasing approximately 30 percent. Families taking part in the food stamp program supplemented their food income by \$2.36 to \$2.94 per person per month in blue stamps. In August 1940, the typical family was buying the following quantities of food per person with blue stamps: 1.08 pounds of butter; 1.34 dozen eggs; about 10 pounds of flour, corn meal and other cereals; a little over 1 pound of dry beans; about three-quarters of a pound of apples, and 7 oranges. These commodities took \$1.20 per month out of the blue stamp dollar in August 1940. By August 1942, they cost \$1.82.

In addition the families bought other vegetables and fruits on the blue stamp list since the total blue stamp supplementation reached nearly \$3 per person per month. It is clear, however, that these low-income families, able to spend only 5 to 7 cents per person per meal out of their ordinary resources, would have been in a very much worse position without the 2 or 3 cents extra they got in blue stamps.

Their number declined from over 18 million in 1939 to less than 9 million persons. But out of that reduced number only 2.3 million persons were assisted. Moreover, as indicated before, possibly 20 million persons more, though not receiving public assistance, were in the same situation. This was fewer people than ever before too, but still a large number, and in the rising national prosperity, they were actually being pushed further back into poverty. The food stamp program did or could mean much to them.

Finally, we are arriving at a period when more and more foods are being rationed. The purpose is to insure more equitable distribution of available supplies. Generally these supplies are at approximately 1935-39 levels, sometimes even higher. But a man with a job is quick to increase his purchase of foods, so that in quantitative terms, demand now far exceeds supply. Yet the issue of ration cards does not insure more food for the very low income people than before. They cannot afford to buy even their rationed quantities. Probably at least 25 percent of our population will not be able to buy their rationed amount because of insufficient income. The food stamp program could be used to make the ration card an effective means to securing their share of the rationed supply.

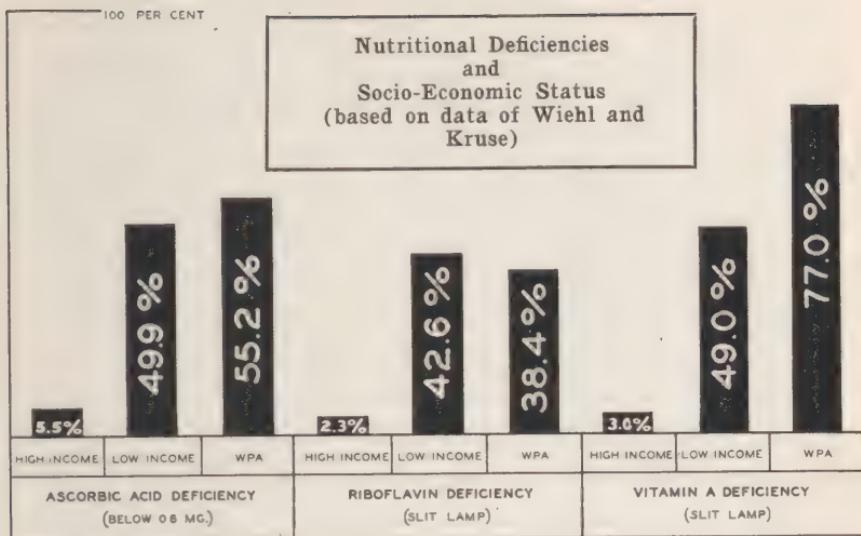
Should the Stamp Plan Be Extended to Low-Income War Workers?

By Ray F. Harvey

Assistant Professor of Government, New York University

THE absence of nutritive foods in the diets of great segments of the American population has become a commonly accepted fact by most Americans. Among other things, World War I emphasized the inadequate diets and unsatisfactory dietary habits of the people. A great deal of study has been devoted to these problems since then. Nevertheless, World War II stresses once again widespread nutrient deficiency and inadequate dietary information. The armed forces have rejected many men permanently incapacitated by lack of proper foods. Others have had to be built up before meeting successfully the physical requirements of the services.

There are many causes for inadequate diets. Not the least important, however, is the economic cause—lack of money with which to buy necessary and essential food. Although there is considerable evidence that proper dietary information is appallingly scanty, it is true, nevertheless, that a great gulf stands between knowing what foods should be eaten and the purchasing of that food. This was true in peacetime. It is true in wartime.



The war has increased employment greatly and increased the incomes of many. But it has increased the cost of living, too. In the case of foods, the increase has been approximately 30 per cent since 1939. It is well known that millions of war workers are not enjoying the wages of skilled and semi-skilled workers; many are paid less than \$20 per week. The Office of Price Administration has estimated for 1942 that approximately 6 per cent of all families will have incomes of less than \$500 a year (less than \$10 a week); that 21 per cent will have incomes less than \$1000 a year (under \$20 a week). Obviously, these low-income families, many of which are working in our war industries, cannot purchase the necessary quantity or the essential nutrient foods. Studies of the Bureau of Home Economics and Bureau of Labor Statistics clearly indicate that families with less than \$2000 a year cannot spend any more on food than they have been spending. If this is true for those up to \$2000 a year, it reveals the serious condition of those with only one-half that amount (the families with which we are concerned in this study).

It has been clearly established that working men and women require more food than non-working men and women. They need better foods, too—foods that supply them with the maximum of energy. Nothing is more vital to the attainment of maximum war production than healthy, vigorous workers in our war industries. For example, the loss in man-hours due to the common cold is appalling. This could be greatly reduced with improved diets for war workers.

"Food Will Win the War"

"Food will win the war" is one of our most popular and persuasive truisms. Not only because it holds out to the farmer the prospect of greater markets and a greater income; not only because it holds out hope to the starving conquered peoples of Europe; but because it holds out to our millions of civilian war workers the promise of an adequate quantity of the proper kind of foods. Nothing can be more devastating to the successful prosecution of the war than an inadequately fed home population, especially those working in our war industries. This is not to say that the sacrifices at home will not be sincerely and genuinely made for the fighting men at the fronts. It is to say, however, that within the limits of our supplies and capacity to produce foodstuffs the low-income war workers must get their proportionate share.

Since they do not get enough money to buy food for an adequate diet, some means must be found to see that they get it. The Stamp Plan, initiated in May, 1939 by the Federal Surplus Commodities Corporation and now contained in the Agricultural Marketing Administration, offers a partial solution to this ever growing problem of under-nourished war workers. The Stamp Plan works as follows: For every dollar spent on foods by eligible persons, the Agricultural Marketing Administration puts up 50 cents in the form of food stamps (blue stamps). These are legal tender at all cooperating groceries for foods specified on the "surplus commodities" list.

The Stamp Plan should be extended to low-income war workers —those with wages of \$20 a week or less. In doing this a genuine contribution to the winning of the war and the peace can be made.

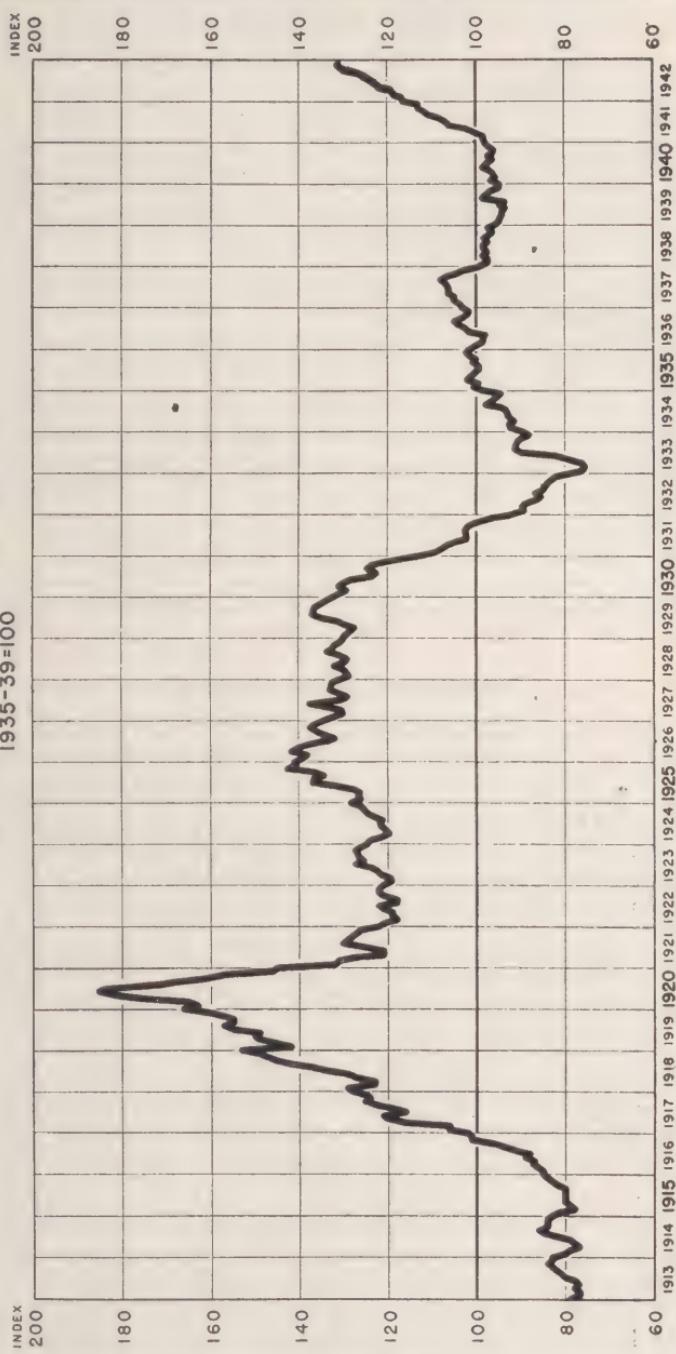
Genesis of the Plan

The operations of the Food Stamp Plan are treated elsewhere in this study. It is well, however, at this point to review briefly its genesis in order properly to place the plan in the war effort.

The Food Stamp Plan is a direct descendant of the surplus distribution program which was a child of depression and necessity. The surplus distribution program was started in 1933 when farmers were burdened with surpluses and millions in the towns and cities were foodless. It was conceived by men like Henry A. Wallace, who sought to rid the farmer of the scourge of surpluses by destroying or otherwise disposing of the accumulated commodities, and by men like Harry Hopkins, who had the tremendous task of putting food into the mouths of the hungry. In fact, when Jerome Frank, Lee Pressman and Alger Hiss went to Wallace and Hopkins with an idea for processing the carcasses of the cattle and hogs slaughtered to reduce surpluses, they thought of it as a relief policy and only incidentally as a producers' policy.

Soon the surplus distribution program was integrated with the Department of Agriculture. It was dovetailed into the more

RETAIL COST OF ALL FOODS
AVERAGE FOR 51 LARGE CITIES
1935-39=100



extensive agricultural programs such as AAA. It became a device for removing farm surpluses in selected commodities in order to stabilize and increase prices. The relief aspect of the program, though not taken from the program's objectives, was definitely subordinated to surplus removal.

This direction of the program is emphasized by the directive concerning the products to be purchased by the government for distribution to the needy or to be designated for the Stamp Plan list for which blue stamps could be redeemed. Surpluses are determined by (1) the quantity in the hands of producers having a depressing effect upon prices; (2) depressed prices, though surplus quantities may not be great; (3) commodities which offer greatest improvement in diets.

The point is this: Food Stamp commodities are selected for the most part on the basis of quantity in farmers' hands and farm prices, not upon the rule of what relief clients need.

The war's increased demands for foodstuffs for the armed services, Lend-Lease, and domestic consumption, have generally dissipated farm surpluses. Farm prices have risen to the point where President Roosevelt deemed it dangerous to allow them to go higher. They were placed under ceilings in October, 1942. It is a little far-fetched to speak of surpluses today which are determined mostly on prevailing quantities over consumption and depressed prices.

Transition During War-Time

Government agencies as well as business, industry, labor, farmers, and, in fact, all society must convert to a war basis or languish in poverty and possibly disappear. The Surplus Marketing Administration (top administrative agency for the Food Stamp Plan) was no exception. Officials of the Department of Agriculture saw the necessity of conversion early in the war program. When Lend-Lease gave the Department an opportunity to expand its purchasing operations for Lend-Lease purposes, officials hurriedly did away with the title "Surplus". The agency with expanded functions was recreated as the Agricultural Marketing Administration. The Food Stamp Plan became an adjunct of secondary importance.

The officials of the Department early sensed the futility of explaining the Stamp Plan and justifying its continuation and possible extension on the dogma of surpluses—surpluses in terms of prices and quantities—with prices being ceiled and foods rationed. The Department of Agriculture realized it had overplayed the "surplus" idea in the years just preceding our entrance into the war. Forseeing this untenable position, Secretary Wickard, as early as 1941, attempted to find a place for the Stamp Plan in the farmers' total war effort. In a news release he said:

"As the nation speeds up its preparedness efforts, the value of the Food Stamp Plan in national health defense becomes increasingly apparent. Basically important as a farm measure—an integral part of the National Farm Program—the Stamp Plan is

also making a vital contribution in building up the physical strength of our less fortunate people who have been without steady employment for years."

The Food Stamp Program is obliged by the course of events to convert all-out to the pressing needs of the war crisis. This conversion must be in the nature of the services it performs. The continued active operation of the Stamp Plan in war may perhaps depend upon how swiftly and expeditiously it can and will emphasize the selection of foods which offer the greatest improvement in diets.

The most effective conversion for the program would be to redirect its energies toward the improvement of diets of low-income war workers. This would require a change in its objectives—from removing surpluses to providing nutritious foods. Specifically, this conversion would entail the establishment of new rules for placing foods on the surplus stamp (blue stamp) list, such as foods known to possess the nutrients lacking in the foods that can be purchased by low-income war workers. It would require an extension of the rules now used to determine those eligible for blue stamps (free stamps). In the past, eligibles have been certified by State and local public welfare agencies from the WPA, General Relief, Old Age Assistance and other public assistance groups. Complete conversion would require the addition of low-income war workers—those with wages of \$20 a week or less.

The Agricultural Marketing Administration is thinking in these terms. This is evidenced in the statement of Roy F. Hendrickson, Administrator, before the New York Times Forum, October 13, 1942:

"But might it not be possible, might it not prove wise—to use the stamp plan mechanism in a broader way? Might not even some rationed foods be put on a stamp list, not because they need to be moved from the farm or market place, but to put them within the reach of low income people? This would be extending the sharing principle, making it possible for even the low-income group to build themselves up nutritionally to a point where they could be of the maximum value to the war effort. They would not only be allowed to buy their share, as far as their ration books are concerned; they would also be able to buy their share, as far as their pocket books are concerned."

Conversion of the Food Stamp Plan from a surplus removal agency to one providing nutritious foods requires no radical shift in activity.

The nutritional value of the plan has not been neglected, though, admittedly, subordinated to surplus removal. A few months after the plan's initiation, studies were made of its effects upon diets in certain key cities, notably Dayton, Ohio. Though these studies are not conclusive and not so defended by the AMA, they do indicate a trend extremely valuable for the plan's conversion to a war nutritional program.

In the studies, made in 1939, certain revealing information appears. In the first place, as an over-all proposition, the par-

ticipating families enjoyed a better balanced diet and a diet of higher nutritional value than non-participating families of approximately equal income and size. Table 1 from the "Economic Analysis of the Food Stamp Plan" indicates the relative difference in the two groups.

It is to be remembered, too, that stamp foods were selected at that time in terms of surplus quantities, prices and/or stabilization of farm prices. None of the foods were consciously selected for their nutritive value. If the blue stamp foods happened to contain essential nutrients, as they frequently did, so much the better.

Of the basic nutrients, it was found that participating families were satisfactorily provided for insofar as the surplus foods accidentally contained them. For example, the participating families enjoyed an adequacy of vitamin A and satisfactory amounts of vitamins B and B₁, chiefly because throughout the period of the survey eggs, butter and cereals were contained among the surplus foods. The non-participating families, in the same income group, did not, or, more likely, could not purchase the necessary quantities of the foods rich in these vitamins.

The survey in Dayton significantly reveals both the participating and nonparticipating families deficient in calcium. It is well known that this element is essential to the best functioning of the human body. The absence of foods containing this vital element from the blue stamp list caused the calcium deficiency among the participating families. Foods high in calcium content are milk, cheese, and some of the leafy vegetables. Since surpluses of these foods did not exist, they could not be included on the stamp list.

The survey indicates also the higher consumption of foods on the stamp list by the participating families than by those not participating. This signifies that poor diets are frequently attributable to the amount of money families have to spend on food. It means that nutritious foods should be made available in adequate quantities to all. As shown elsewhere in this study, blue stamp expenditures in September, 1942 were distributed as follows: 25 per cent for eggs, 23 per cent for cereals, 42 per cent for vegetables, 10 per cent for fruit. Thus participating families secured some of the foods necessary for proper diets.

When the Dayton survey was made the stamp list included the following: eggs, butter, grain products, vegetables (cabbages, fresh peas, dry onions and dry beans), fruits (fresh tomatoes, fresh peaches, fresh pears, dried prunes). The stamp list for October, 1942 was: eggs, corn meal, dry beans, hominy grits, flour, fresh apples, fresh vegetables including Irish and sweet potatoes. This latest list, reflecting the impact of the war, could hardly be defended on its balanced nutritional value. Eggs were on the list largely because no variety of selection would have remained if they were removed. Their presence, too, could not be explained in terms of surpluses or of depressed prices. The October list was inadequate, but unless the AMA seeks new rules for putting foods on the list, it will become shorter and shorter as the war progresses.

TABLE I—Average nutritive value of the diets per person per day of households participating with orange and blue stamps and of nonparticipating households, comparable in household composition and income distribution, Dayton, Ohio, August—September 1939

Participation, household composition, and family income per month	Households	Average household size ¹	Average nutritive value per person per day							
			Food-energy	Protein	Calcium	Iron	Vitamin A	Vitamin B ₁	Ascorbic acid	
All households:										
Participating (orange and blue stamps).....	Number 2 204	Persons 3.79	Calories 3,040	Grams 84	Grams 0.81	Milligrams 15.4	International Units 7,140	Micrograms 1,770	Milligrams 101	
Nonparticipating.....	2 204	3.75	2,560	77	.75	13.8	5,420	1,800	87	
All incomes combined for households of—										
2 persons:										
Participating (orange and blue stamps).....	57	2.00	3,860	110	.98	19.2	10,180	2,270	131	
Nonparticipating.....	57	1.98	3,220	91	.83	16.0	7,540	2,050	113	
3 and 4 persons:										
Participating (orange and blue stamps).....	78	3.36	2,950	81	.87	14.5	7,050	1,740	98	
Nonparticipating.....	78	3.36	2,830	79	.83	14.0	5,630	1,640	90	
5, 6, and 7 persons:										
Participating (orange and blue stamps).....	69	5.74	2,860	79	.72	14.9	6,320	1,650	95	
Nonparticipating.....	69	5.66	2,190	72	.68	13.0	4,660	1,450	78	
All household types combined, with incomes per month of—										
\$25-\$49:										
Participating (orange and blue stamps).....	46	3.44	2,860	79	.72	14.5	6,510	1,670	85	
Nonparticipating.....	46	3.49	1,760	78	.75	14.0	5,150	1,640	80	
\$50-\$74:										
Participating (orange and blue stamps).....	114	3.94	3,060	84	.81	15.6	7,090	1,770	107	
Nonparticipating.....	114	3.88	2,730	75	.70	13.5	5,090	1,580	84	
\$75-\$99:										
Participating (orange and blue stamps).....	44	3.73	3,150	89	.90	15.6	7,880	1,885	100	
Nonparticipating.....	44	3.68	2,890	84	.89	14.3	6,580	1,640	103	

¹ Based on number of persons fed from the family food supplies during the week of the study.

² The 204 households in each group of the matched comparison were distributed (or weighted), as follows:

Family income per month	Total number of households	Number of households of—		
		2 persons	3 or 4 persons	5, 6, or 7 persons
\$25-\$49.....	46	17	16	13
\$50-\$74.....	114	29	41	44
\$75-\$99.....	44	11	21	12
Total.....	204	57	78	69

To summarize, studies of the Food Stamp Plan's operations show (1) increased quantities of foods consumed by participating families, and (2) insofar as the stamp foods contained the essential nutrients and energy foods, a significant gain was observed.

These findings demonstrate the excellent case for its conversion to use for low-income war workers. If foods selected for redemption in blue stamps were chosen with an eye to their nutrient and energy values, really significant gains could be made to the war program. Since surpluses reckoned either in quantities or by price no longer exist, the Food Stamp Plan should make this important and necessary change in the direction of its program. This is the basis upon which the Food Stamp Plan can properly and justifiably continue its expenditure of public funds during wartime.

It has been estimated by the Office of Price Administration that 40 per cent of the people have incomes of less than \$1500 in 1942. Many of these are war workers. They cannot buy the essential foods. The AMA estimates 8.3 millions are eligible for surplus foods under the present rules (that is, receiving public assistance due to unemployment, old age, dependent children and so forth). Of this number approximately one-fourth received blue stamps during the year 1942. The reduction in participants from over four million in 1941 to slightly over two million in 1942 was due to many factors discussed elsewhere in this volume. While employment in war industries more or less automatically removes the person from the eligible list to receive surplus foods, his need for additional food is greater today than ever before.

The AMA is not restricted by law to public assistance cases only. In fact, others have been included in the eligibles for blue stamps, sometimes referred to as "border line" cases. This was the basis of the Food Stamp Plan as set up in Pottawatomie County, Oklahoma in 1939. It has been used also in other but rather restricted areas, mostly in the South. In these local areas, participation in the Plan was opened to those with incomes of \$19.50 a week or less though not on public assistance. Therefore, the AMA has precedent and authority to include low-income war workers in the benefits of the Food Stamp program.

Food rationing and continuation of the Stamp program may appear paradoxical. Rationing is introduced only when shortages develop. It is an essential concomitant of price fixing and a political necessity in a democracy at war. Equalization of sacrifice is demanded by the essential conditions of winning the war and the peace. Rationing as a program and as a political and economic fact does not automatically nullify food distribution to the needy through such programs as the Stamp Plan. Rationing is essential when and where shortages occur, in order to insure equitable distribution of the available supply, but, what is significant, it does not guarantee that all will be able to buy their allotment. Though food is rationed it will still require money to buy it. And food prices have risen 30 per cent since 1939 with few conceding the peak has been reached. It is estimated that fully 25 per cent of

the people will be unable to buy their food rations. Therefore, these people will need help to get what is said to be their rightful share. The Stamp Plan can insure this. But it can only if it is completely converted to the war program. The political problem of conversion to a low-income war worker program can be reconciled easily by shifting the base of the argument for its existence from surpluses to that of supplying nutritious foods to needy war workers.

In short, rationing of foods, instead of denying the validity of the Food Stamp Plan, enhances the need for essential, nutritious foods and thereby justifies its continuance and its extension to low-income war workers. Roy F. Hendrickson, Administrator of the AMA, said in October, 1942: "What of the group . . . who won't be able to buy their full ration, because their incomes won't stretch that far? We are going to need them, too, in this total war effort. Shouldn't we see to it that they get the share which will make them strong enough to work and fight to the fullest of their capacity?"

Administration of the Plan

The administrative machinery for such a converted Stamp Plan program is now in operation. The top-side agencies—National, Regional and State—have had years of experience with surplus distribution and the Stamp Plan. The top-side personnel in the Department of Agriculture and the Agricultural Marketing Administration are sympathetic to the program's extension to low-income groups. Administrative machinery is now operative in 1,471 counties and 88 cities in the United States. The Food Stamp Plan has followed rather closely the line of the cities and towns throughout industrial America—areas with the highest concentration of needy. These are the areas into which it would go, should its benefits be extended to low-income war workers. In most of these areas administrative machinery is now operating.

In New York State, for example, the Food Stamp Plan was operative in the following counties and cities as of September, 1942:

Area	Eligible		Participating	
	Cases	Persons	Cases	Persons
Buffalo—Erie County	6,682	17,229	4,868	13,133
Elmira	492	1,181	360	891
Jamestown	623	1,416	298	733
Niagara Falls	529	1,557	336	1,136
Batavia	135	279	41	116
Monroe County	667	2,167	444	1,470
Oswego	588	1,841	273	1,000
Rochester	6,038	20,075	4,304	14,166
Utica	1,406	3,370	912	2,510
Newburg	336	783	162	405
New Rochelle	947	3,094	580	1,996
White Plains	595	1,874	406	1,366
Yonkers	1,757	6,177	1,334	4,734
Amsterdam	136	330	79	157
Montgomery County	436	972	194	541
Schenectady	252	600	225	532
Troy	868	1,635	346	654

Though war industry areas are not known specifically, it can be rather safely assumed that these are the major industrial areas in New York State. New York City has been omitted from this list because it is known not to be a war industry city.

The chief administrative problems growing out of conversion are:

- (1) The determination of income groups to be included. In view of past experience, e. g., Birmingham, Alabama and Pottawatomie County, Oklahoma, this might be fixed at \$19.50 or \$20.00 a week. All war workers receiving wages of say \$20.00 a week or less could be automatically blanketed into the program.
- (2) The greatly increased case load would necessitate additions to the staffs of the various levels of the administrative machinery. Since the case load has been greatly reduced in the last year, this might not entail a vast expansion of personnel over 1941.
- (3) Probably the most difficult administrative problems would be certification and stamp distribution. Under the present plan State and local welfare agencies certify eligibles for blue stamps. Likewise, these agencies aid in stamp distribution. Obviously, other agencies should perform these services for low-income war workers. The AMA might set up its own field offices staffed with its own personnel to perform these tasks. Unions might be utilized, or the plant managements. The over-all certification for eligibility would, of course, be the wage received. All industrial managements might be required to supply this information to the AMA or to some designated local committee. For the more detailed aspects of certification, rules would have to be set up by the AMA. It is fairly obvious, however, that certification and stamp distribution require plant or industry units for effective administration.
- (4) The home visits that are now a considerable part of the administrative work would obviously be increased with inclusion of low-income war workers. State and local agencies now existing might well perform some or all of this work.

Obviously these are not all the administrative problems, but they are indicative of the types that will present themselves.

Politically, the conversion of the Food Stamp Plan from a surplus program to a nutritional program should not be difficult. The groups that have supported it in the past—farmers, workers, food merchants, and the needy—should find it as acceptable in the new form as in the old. This is not to say, however, that each group will accept it if confronted with such a change. Workers might ask: Is this a plan for keeping wages low or even of lowering them? It is a fair question. Farmers might ask: Is this sub-

sidizing wages for workers? If so, then where do we come in? Other groups might oppose the Food Stamp Plan's extension to low-income war workers as the beginning of a permanent subsidization of still greater segments of the population.

The demands of the war are so urgent that the low-income war worker cannot be ignored. To do so would be tantamount to failure to utilize all our resources in total war. Providing nutritious foods to low-income war workers has been faced in England and the solutions there are discussed in this volume. War workers must be kept healthy. An important mechanism for accomplishing this purpose is the Food Stamp Plan. Its conversion to a nutritional program including war-workers with the public assistance cases is essential to the war effort.¹

¹ Further discussion of this subject may be found in *Economic Analysis of the Stamp Plan* (1940) and Ray F. Harvey, *Want In the Midst of Plenty* (1941).

The Block Leader Plan

By Ruby Green Smith

State Leader of Home Demonstration Agents
New York State Colleges of Agriculture and Home Economics
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Our rural homemakers receive the valuable advice of extension service workers, but the urban housewife is not reached by such activity. The block leader plan, first tried in the World War I, and now being utilized again, is an attempt to bring to the women of our cities the information and help received by rural housewives.

BECAUSE of the concentration of consumers in cities, it was recognized nationally and in New York State, during the first World War that it was essential to the success of the Food Administration for the government to have official lines of communication with homemakers in cities. Since County Home Demonstration Agents, employed on state and federal funds, and the organizations of homemakers associated with them furnished such lines of communication for rural women, an expansion to cities was made of this already nation-wide system of Extension Service for public education in homemaking for adults; thus immediate action, with economies, was possible because the personnel of the State Colleges, in every state, included administrative officers who could organize and supervise an extension of home demonstration work to cities, at a minimum of expense to the government.

New York Led the Nation

New York State made appropriations for Urban Home Demonstration Agents while the issue was still under consideration by Congress. A national appropriation of more than a million dollars to the Extension Service of the U. S. Department of Agriculture followed New York's action. In New York the Urban Home Demonstration Agents, like the County Home Demonstration Agents, were appointed and directed by the State Extension Service of the State College of Agriculture in which the present State College of Home Economics was a department in 1917. Dr. Howard E. Babcock, then a member of the Cornell University faculty, was named State Food Commissioner and was in administrative charge of the urban work, with the cooperation of home economics professors.

As organized and administered by the State Colleges or State Universities throughout the United States, organizations of homemakers were developed to give the work of Urban Home Demonstration Agents local supervision and direction and to help them to

adapt government programs to local conditions. An "open door" policy for the offices and educational meetings of the city Home Bureaus, was observed whereby any city homemaker might obtain information on home problems or might volunteer her aid to the Home Demonstration Agents by enlisting in the Home Bureaus.

Executive committees for the work were elected by the people mobilized in Home Bureaus. Women responded eagerly to this kind of opportunity to do war work by enrolling in City Home Bureaus. The Executive Committee in each city named special and standing committees to help carry forward the government's programs. They also helped to mobilize volunteers for work as speakers, writers and organizers, and food demonstrations were given by local leaders who were trained by Home Demonstration Agents.

The programs fostered by the Home Bureaus for all homemakers, related primarily to the conservation of foods through elimination of waste, food preservation by canning and otherwise, the substitution of plentiful for scarce foods, the production of foods in Victory Gardens, and education regarding changes of diet due to the use of foods not needed for shipment overseas. Supplementary programs related to conservation of clothing and textiles as they became scarce, of money in order to buy war bonds, of fuel, and of woman power. Participation in these programs enabled every homemaker to contribute to the war effort, while caring for her family at home.

In World War I

As part of the Home Bureau organization, and as only one of many methods used in its Extension Service, "Block Leaders" were chosen by the elected executive committees in each city. These "Block Leaders" were asked to act as chairmen in the city blocks where they lived and to associate with themselves responsible women who would systematically help to reach every home in her block, whenever important messages might come from the state or national government regarding ways in which homemakers could help to win the war at home. Such messages came from the National Food Administration, from the Extension Service of the U. S. Department of Agriculture, from the National and State Defense Councils, from the State Colleges, and from other State and national departments and agencies.

In order to start a democratic organization of homemakers for the Home Bureaus and to get a recommended list of "Block Leaders", a meeting was called that included the presidents of all women's organizations in each city. To these meetings came women of all races, colors, and creeds. Aliens and newly naturalized Americans were invited through their churches and schools. This first meeting included homemakers, newspaper reporters, preachers and teachers; it was announced in the newspapers, schools and pulpits, as open not only to presidents of organized groups but to any who might be interested in helping to guide this new war

work for women. Thus at this first meeting a cross section of each city's population was represented and personnel for "Block Leaders" and for other committee work was discovered through advice from key people with city-wide acquaintances or who knew their neighborhoods well.

Illustrations of the significance of the Food Front programs of Urban Home Demonstration Work may be found in the records of gluts and scarcities on city food markets during World War I. These were relieved through consumer purchases that were guided by Urban Home Demonstration Agents of the State and National Extension Services. For instance, when the Providence, Rhode Island, Home Demonstration Agent wired the writer of this report, then in the Washington, D. C. office of the Extension Service, that bananas were going to waste on the city's markets, the Providence Urban Home Demonstration Agent was requested to ask the aid of newspapers and "Block Leaders" in telling the people of the situation under the slogan—"It is patriotic to eat bananas today". Menus and recipes that included bananas were publicized. Plans for their use extended from breakfast fruit bananas through banana salads for luncheon and tea, to banana ice cream for dinner. The response was so immediate that 2,800 bunches of bananas moved off the glutted markets in a few hours; and before this patriotic run on the market could be stopped, Providence dealers had to S. O. S. New York City for more bananas to satisfy awakened consumers!

Without radio and with relatively few telephones during the first World War, the only ways to reach the people were by personal visitation or through newspapers, bulletins and magazines, which gave less space then to home economics information than they do in recent years. When international food problems became acute, editors and preachers helped the Home Demonstration Agents, Home Bureau members, and "Block Leaders", to reach the people, some of whom had access to weekly papers rather than to dailies. "Block Leaders" were essential during World War I. There are many other methods available today whereby the public can get information and can be induced to act upon it patriotically.

Government policies regarding food and other shortages in the necessities of life and in things which change family habits, need much interpretation. Illustrations of the international importance of Urban Home Demonstration Agents occurred when ex-President Herbert Hoover, then United States Food Administrator, was cabled that our European Allies and our own fighting men must have more wheat. The bushels specified were not available on the markets of the United States. Consultations between the Food Administration and the U. S. Department of Agriculture revealed the fact that the only way to get the wheat for shipment to Europe was to reduce its consumption in the United States. With the assurance that the Urban Home Demonstration Agents of the Extension Service would start educational campaigns and demonstrations to "save wheat for over there", Mr. Hoover cabled to

European representatives: "We will find the wheat supplies". And we did: The patriotism of housewives was not found wanting; wheat originally routed for consumption in the United States was re-routed overseas. This illustrates again the seldom recognized but actual power of city consumers who can effect market situations constructively when guided by Urban Home Demonstration Agents who are in touch with authentic information regarding agriculture and Home Economics, because of their official relationships to the United States Department of Agriculture and to the State Colleges.

Extension work settled a strike in 1918. Another illustration of the far-reaching significance of Urban Home Demonstration work, and of the "Block Leader" plan, and other methods used in the Extension Service, was found in Pueblo, Colorado, in 1918. A strike in mines furnishing war materials was threatened by laborers because they didn't understand and therefore resented the Food Administration's regulations that in order to buy white flour, other substitute cereals must be purchased with it, in order to accumulate, by reduced consumption in the United States, the wheat promised to the Allies by Mr. Hoover of the Food Administration. Many of the miners were foreigners, knew little English, and, with the approval of their wives, were about to call a strike. The Urban Home Demonstration Agent went to the section of Pueblo where discontent was rife; as she walked along the street, she was appealed to by a distracted miner, whose wife and baby had just died while he was alone with them. The Urban Home Demonstration Agent had not had the advantages enjoyed at present in the State College of Home Economics which now includes the study of family life problems. But she used her human sympathy and common sense, helped the grief-stricken man through this crisis, met his neighbors and friends, and finally was asked:

"Who are you, and what are you doing here?"

She replied, explaining that she was employed by the government to help homemakers with problems like the one that she heard them discussing—what on earth to do with the cereals Uncle Sam forced them to buy in order to get the white flour they liked! Many of them had come to the United States in order to be free. They resented this rule and wanted to strike back at this nation with their only weapon—a strike of miners in an industry essential to the war's prosecution.

The young Urban Home Demonstration agent felt overwhelmed but she was brave. Gently she asked if they would care to have her demonstrate how to make good food from the substitute cereals. They liked her and they agreed to call together the discontented miners' wives for the lesson. They came, bringing babies, cats and dogs, along with a good deal of skepticism. The young Home Demonstration Agent found that she had to stir the bread batter out of doors, in a kettle that had been used for laundry earlier in the week; and she had to cook the loaves in a Dutch oven such as she had heretofore considered a mere curiosity! Her home

economics training fortified her, the good fairies were with her and the bread was perfectly fine. The threatened strike was called off! After that the Home Demonstration Agent could get publicity and help in organizing "Block Leaders" and in attracting audiences of women who were willing to learn whatever the government wanted taught. The miners asked her to teach their wives to "cook in English" and not to forget to "show them how to make American pies".

Urban Home Demonstration Work Now

In order to help homemakers in their work in winning the war on the Home Front, extremely urban New York State should make available to homemakers in all of its cities and to the 15 counties not now served, the kind of government help to be found in the work of Home Demonstration Agents who have proved to be important public servants during the first World War and during two depressions, as well as in times of prosperity and peace.

Records of costs, provided by State and federal appropriations for urban home demonstration work in 1917-1918, are not readily available, as they would require a search of national, state and city archives. This can be done but it will probably be more pertinent to refer to present day costs of fine samples of such work in New York State.

Because of the interest and support of the local people and of the decision of the State Colleges to encourage the continuance of urban home demonstration work in Syracuse, Buffalo and Rochester, New York State has the distinction of having tried the largest experiment that has been carried forward in any State or nation, in this form of adult education in home economics for city homemakers.

In these three cities the costs for 1942 are as follows:

<i>City</i>	<i>County Appropriations</i>	<i>Home Bureau Membership Dues</i>	<i>Total</i>
Syracuse	\$10,000	\$1,346	\$11,346
Buffalo	12,500	2,494	14,994
Rochester	13,000	1,116	15,116
Grand Totals.	\$35,500	\$5,956	\$41,456

No federal or State aid has been given these cities (except that of the help of certain Extension staff members of the State Colleges), while county home bureaus are given both State and federal money.

The grand total \$41,456 of public and private moneys, so far used in urban home demonstration work, is supplemented by

much volunteer help, making the per capita cost of this type of adult education low. Urban agents who are trained home economists are assisted by Extension Service staff members from Cornell and by hundreds of volunteer local leaders who are trained by the relatively small salaried personnel.

The costs of research, organization and administration are already provided at the State Colleges. City women hope to be aided by an extension of home demonstration work to their cities since it has become important to progressive home life in three cities and in about three-fourths of the counties, in whose offerings many city women are interested. It has thus been demonstrated that authentic information from the State Colleges can be deeply significant to better housekeeping and homemaking in the complex life of three of the largest of New York's up-state cities.

The extension service teaching reaches far beyond the home bureau membership which consists of homemakers who enter into a partnership with their State Colleges at Cornell University to carry the results of research to a maximum number of homemakers throughout the three cities served. Locally elected neighborhood officers and local leaders, chosen for their teaching ability and qualities of leadership, are kept abreast of how to apply the constantly developing sciences and arts to housekeeping and homemaking. For example, in Buffalo, there are groups of Italian, Negro and Polish women, as well as neighborhood home bureau groups of women whose families have long been Americans. Women of all of these varied social, economic and educational backgrounds find a common denominator in homemaking. In city-wide meetings, home bureau audiences are a democratic spectacle.

City Home Bureau Programs: The educational programs include not only nutrition but the study of other phases of home life. Methods used and the scope of the programs are briefly outlined here. Methods include demonstrations, lectures, training schools, conferences, press, service letters, tours, extension minute men, exhibits, and radio. Programs that help to solve home problems are taught to homemakers, by the City Home Demonstration Agents, by trained Local Leaders, and by members of the Extension Service faculty from the State Colleges. This teaching deals with the application of science and of art, in the following aspects of home and community life:

Family Life: Child guidance; adolescent and adult psychology; happier human relationships; care of children in groups.

Foods and Nutrition: How to feed the family so as to guard its health, from infancy to old age; food selection in relation to family incomes; food preparation, serving and preservation; menus for the family and for entertaining; lunches for school children and for war industry workers; and community meals.

Clothing and Textiles: How to clothe the family (through selection, construction, or remodeling) in good taste, in styles adapted

to personalities, with due regard for health and for variable incomes; how to choose textiles.

Economics of the household and household management: How to save woman power, as well as money, through equipment and methods which save labor, energy, and time; rearrangement of kitchens and other working areas; how to conduct the business aspects of homes, and to become intelligent consumers; how to spend or save family incomes to buy a satisfying living, as well as to buy war bonds and to help with financial needs of families whose homes are devastated by war.

Household Art: Selection of furnishings; rearrangement, reconditioning, and refinishing of old furniture; window, floor and wall treatment, crafts; adequate and artistic lighting for homes and for community buildings; how to make homes more beautiful and comfortable.

Recreation: Dramatics, games, music, playgrounds, parks, movies.

Gardening: Landscape improvement for home and community grounds, vegetable and flower gardening.

News Writing and Radio: Techniques taught in training schools for Home Bureau leaders.

Household Mechanics: Repair of sewing machines and other household equipment.

Community Projects: Enterprises relating to community beautification and to better schools, markets, churches, health, recreation, public welfare and libraries.

Supplementary Programs: Significant work which the organized homemakers may undertake in cooperation with other state agencies and organizations.

The State's responsibility for equalizing the educational opportunity for all of its homemakers. In home demonstration work, public, federal, State and county appropriations that total \$463,747.60 are at present helping New York State homemakers to improve their homes in 42 counties while but 3 cities in this urban State are being helped. Since good homes are the most important assets of the nation, being the places from which all leadership, progress, and citizenship start, it is a matter of fundamental justice for the State to provide democratically for the completion of this form of public education for adults which is now so well underway. This is especially important in New York State which has a greater number of homes than any other of the United States.

In cities there is more bad housekeeping and unsatisfying home-making to the square mile than anywhere else. The State Extension Service of the State College of Home Economics conceives it to be

among its duties and opportunities to reach every home in the State, as soon as the State makes it possible to finance the completion of this form of adult education for which the people's demands upon the State Colleges are almost overwhelming.

The Home Bureau Creed:

To maintain the highest ideals of home life, to count children the most important of crops, to so mother them that their bodies may be sound, their minds clear, their spirits happy, and their characters generous.

To place service above comfort; to let loyalty to high purposes silence discordant notes; to let neighborliness supplant hatreds; to be discouraged never.

To lose self in generous enthusiasms; to extend to the less fortunate a helping hand; to believe one's community may become the best of communities; and to cooperate with others for the common ends of a more abundant home and community life.

This is the offer of the Home Bureau to the homemaker of today. Democracy is not only a form of government; it is a way of life. Democracy's principles of respect for human dignity, its cultivation of individuality, and its organization for cooperative living, are all to be found in the kind of homes that are the goals of home demonstration work.

Nutrition and Dental Decay

By Dr. BION R. EAST¹

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An informative letter containing highly important data on the relationship of nutrition to dental decay was received from Dr. East by the Chairman of our Committee. The letter was of such interest as to merit its publication in this report.

AT THE OUTSET we should realize that little can be done *to prevent* tooth decay among the industrial workers. It is too late. The major damage occurred in childhood. If your desire dentally-fit industrial workers, you must become concerned with the physical well-being of the mothers during pregnancy and their children during infancy and childhood. It should be recalled that the child's permanent teeth begin to calcify before or shortly after birth and evidence is available that the nutritional state of the mother and the child has a marked bearing on the teeth of the individual when he has reached the age of industrial workers.

In 1940, the American Dental Association's Economics Committee made a survey to determine the immediate dental needs of the adult population of the United States. When the findings of this survey and the costs of servicing those needs are used as an index of the dental needs of the entire adult population, the cost, based on the modest fee system of the U. S. Veterans' Bureau, would amount to approximately \$5,000,000,000.00. This estimate should be considered in conjunction with the well-established fact that 50 per cent of the population cannot afford or does not obtain dental service from private practitioners. The difficulty of keeping the population dentally fit by repairing the damage after it has occurred is better understood when we take into account that the total amount of money appropriated at state level, by all of the states, the District of Columbia, and our territories, for all types of medical care, including care of the insane, during the year 1940, amounted to \$190,653.400.00.

Let us approach the dental problem in another way. There were in the United States on January 1, 1940 approximately 22,049,000 children aged 6 to 14. Each of these children should have, during the course of his life, 52 teeth—20 temporary and 32 so-called permanent teeth—or a total of 1,156,548,000 teeth. However, we will only consider the problem of tooth decay and the costs

¹ The statements and opinions contained herein are entirely those of the writer and do not necessarily represent those of Columbia University or the DeLamar Institute of Public Health.

of "curing" it by fillings as it might affect 4 of these teeth—namely, the four first permanent molars. This particular age group would have 88,196,000 of these particular permanent teeth. There is convincing evidence that during the 10-year period (from age 6 to 14) at least 75 per cent of these teeth will decay at least once. There is also evidence which strongly suggests that 50 per cent of the teeth will be in the mouths of children whose parents cannot or will not have the teeth cared for by a private dentist. This suggests that there will be 33,073,500 teeth which should be cared for, in whole or in part, with public or endowed assistance. If it were possible (the improbability is recognized) that the entire budgets which were available for all "medical and dental care by state agencies" (\$190,653,400.00) among the various states were set aside to care for the dental defects which will occur among these 4 permanent teeth, there would be available \$576 to meet the ten year dental needs of each tooth; approximately 6 cents per year per tooth. When it is recognized that 76 per cent of the above-mentioned \$190,653,400 was set aside for the care of the insane, the improbability of meeting the problem by this method, filling decayed teeth, is apparent. It may be well to include in the record that, of the remaining 23 per cent of the total appropriations among the states of the United States and its possessions available after the needs of the insane were met, 4.8 per cent was assigned to "care of the crippled child", 19 per cent for "general and allied medical care", and two-tenths of one per cent for "dental programs".

New York State for the year 1940 appropriated \$35,952,200 for "medical and dental care by state agencies". Of this, 95.5 per cent was for "psychiatric services", 2.9 per cent was for "services for the crippled child", 1.6 per cent for "general and other allied special medical care".

While the exact amount appropriated by New York State for dental service is not immediately available, I feel safe in stating that it was a relatively minor amount. There were, in the State of New York as of January 1, 1942, approximately 1,700,000 children ages 6 to 14. They would have 6,800,000 first permanent molars. If 75 per cent of these teeth decay at least once over a 10-year period, and if 50 per cent of the families need assistance if the child is to receive the needed dental services, there would be 2,550,000 teeth to be cared for in whole or in part at public expense. Of the entire 1940 appropriation for all health purposes by the state of New York, 95.5 per cent was set aside for psychiatric service. The remaining 4.5 per cent, \$1,617,894.00, was available to meet all the costs of other state public health activities.

If it were possible for the entire 1940 New York State budget, for all official agencies for medical and dental care, other than that set aside for the care and treatment of the insane, to be available over a ten-year period (the period from six years to fourteen years of age) to care for the needed fillings of the 2,550,000 permanent first molars, the amount available would be \$0.634 per tooth—approximately six cents per year per tooth.

If the above statement only approximates the truth, it seems apparent that any and every legitimate method or practice which could materially ease this pressing problem should be put into effect. Therefore, it seems pertinent to take cognizance of the relationship between adequate nutrition and the incidence and prevalence of tooth decay.

It may be well to state that the etiology of tooth decay is not known. It is well also to emphasize that it is impossible, with our present knowledge, to plan a diet which will yield 100 per cent resistance to tooth decay among the population. However, apparently well-conducted investigations indicate that very marked increases in resistance to the disease can be brought about among children by an improved nutritional status of the individual and for its mother during pregnancy and lactation.

Howe, White and Elliott, of the Nutrition Department of the Forsyth Dental Infirmary for Children, have shown the effect of nutritional supervision upon the incidence of dental caries among children.¹ The children involved in the study, both the control and experimental group, were from the same economic and social level. They belonged to the low income group, being children eligible for free dental care at the Infirmary. The food budgets of the families whose children composed the experimental group were not supplemented. The entire effort was to acquaint the mothers and the children of this group with proper food habits, purchasing of food, menu-planning, the child's level of consumption of various foods, meal-spacing, habits of sleep, rest, activity, recreation, etc. The teaching emphasized the following foods as the *desirable* basis of their daily diet:

Milk, 1½ pints to 1 quart

Citrus fruit, 1 serving (3 ounces of juice or its equivalent)

Other fruit (fresh, dried, canned), 1 serving

Potato, 1 serving

Other cooked vegetable (preferably green or yellow) 1 serving

Raw vegetable, 1 serving

Egg, 1 (or at least 4 weekly)

Meat or fish (or other protein-rich food), 1 serving

Whole-grain bread or cereals, 2 servings

Butter or fortified oleomargarine on bread and vegetables

Cod-liver oil or some other source of vitamin D was recommended during the winter months.

It is apparent that the above items and their amounts are what every child should have, irrespective of whether their consumption would have a retarding effect on the incidence of tooth decay. The mothers of the children composing the control group were not interviewed or instructed concerning the food habits, consumption, etc., for their families.

¹ Howe, Percy R.; White, Ruth L.; and Elliott, Mark D. The influence of Nutritional Supervision on Dental Caries. *Journal of the American Dental Assn.* 29, 38 (January, 1942).

At the end of the experiment, the number of new cavities per child per year among the two groups was as follows:

AGE GROUP	Without Nutrition Supervision	With Nutrition Supervision	Per Cent Decrease
3 to 4.....	4.82	2.41	50
4 to 5.....	4.07	2.14	47
5 to 6.....	4.89	2.61	47
6 to 7.....	3.88	2.85	27
7 to 8.....	5.89	2.03	66
8 to 9.....	4.22	2.04	52
9 to 10.....	3.43	1.42	59
10 to 11.....	7.72	2.42	69
11 to 12.....	6.11	1.06	83

This study emphasizes not only the importance of an adequate diet but the effect of intelligent educational methods among mothers.

From the same institution comes another interesting study, the results of which are important when one considers the *prevention* of tooth decay.

Sognnaes and White (Sognnaes, R. F., and White, R. L.: Oral Conditions of Children in Relation to State of General Health and Habits of Life. *Am. J. Dis. Children.* 60, 283-303. 1940.) made a survey of the dietary habits of mothers during pregnancy and lactation and the amount of tooth decay among their children's permanent teeth. The relationship of the dietary habits of the children and their resistance to the disease was also reported. The control and experimental groups were selected according to the amount of tooth decay among the children. This division was made before anything was known about the previous dietary habits of the mothers or the children. *At the beginning of the study* it was found that among Group I, the decay-resistant group, 11.3 per cent of the children's temporary teeth had been attacked by tooth decay, and 18.2 per cent of their permanent teeth were so affected. Among Group II, 93 per cent of the temporary and 80.5 per cent of the permanent teeth had decayed, respectively. After the groups were formed, the past histories of the mothers of the children in each group were studied. It was found that 15 per cent of the mothers of the children of Group I, the group with relatively little tooth decay, scored "excellent" regarding general health and well-being, 64 per cent as "good", and the remaining 21 per cent as "fair"; while, during pregnancy, there were none among

the *mothers* of Group II, the group with much tooth decay, that could be scored as "excellent", 28 per cent were "good", and 72 per cent were "fair" (the criteria for the "scorings" were according to the standards established by the Children's Bureau, U. S. Dept. of Labor, *The Expectant Mother*, Folder No. 1 (1936).

The health of the *children* of the two groups during infancy, scored according to the above-cited criteria, was as follows: Among Group I, 22 per cent could be scored "excellent"; 64 per cent, "good"; and 14 per cent, "fair". Among Group II, the caries-susceptible group, only 6 per cent were "excellent"; 22 per cent, "good"; 67 per cent, "fair"; and 5 per cent were "poor".

It is a generally-accepted fact that cod-liver oil or some form of vitamin D is advisable to assure proper tooth formation during infancy and childhood. Among these Boston children the results of varying vitamin D intake and its relationship to the health of the child, as evidenced by freedom from old rickets, is found. None of the children in Group I showed any evidence of old rickets, while 50 per cent of the children in Group II, the group with much tooth decay, had such evidence.

In regard to specific evidence on the relationship between the incidence of tooth decay and vitamin D intake, it should be emphasized that vitamin D is only one of the known nutritional and other factors which probably contribute to the formation and maintenance of teeth which are relatively highly resistant to the cause or causes of tooth decay. However, it should also be noted that this particular vitamin is not widely distributed in foodstuffs and that the habits of civilized man make it difficult to obtain an adequate supply from the sun's rays.

The Health Organization of the League of Nations in 1935 made the following recommendations:

"We remember that, in most countries, the problem of providing adequate dental treatment in schools for already-existing caries is an insoluble one, and that for this reason it behoves public health authorities to give closest attention to other possible methods of combatting the disease.

"While encouraging the toothbrush for social and esthetic reasons, we may, at the same time, reflect that most of the sound teeth in the world are in the mouths of people who have never seen a toothbrush in their lives. Dental caries may be attacked by improving the diet of expectant and nursing mothers, infants and growing children, particularly in respect to its content of calcium, phosphorous, and vitamin D.

"It would be cheaper to supply school children regularly with vitamin D in some form than to supply them with dental treatment, treatment which, for the most part, consists in an attempt to repair the ravages of already-existing caries. This is a question which merits the closest attention on the part of public health authorities." *Quarterly Bulletin of the Health Organization, League of Nations*, Vol. IV, No. 2, June, 1935.

Apropos of the above discussion, we offer with some hesitancy statistics regarding mortality rates for rickets among children under 5 years of age residing in New York City for certain specified years. We are aware of the errors which may be and usually are contained in such statistics. Among these errors may be improper diagnosis, etc. However, it is striking to note that in New York City during the years specified there should occur deaths which, in the opinion of the physician certifying to the cause of death, could possibly be attributed to rickets. During the years specified below, the rate per 100,000 for deaths from rickets among the children of this age group of New York City follows:

Year	Mortality Rate Per 100,000
1911-15	8.58
1916-20	8.62
1921-25	10.75
1926-30	7.19
1931-35	3.93
1936	1.05
1937	0.65
1938	0.44
1939	0.45
1940	0.00

Vitamin D milks were made available in New York City during 1935, since which time there has been a steady decline in the reported deaths from rickets until, during the year 1940, no such deaths were reported. It should be emphasized that vitamin D milk distribution among the population was only one of the many methods and agencies that contributed to this index of a better condition of health among the age group specified.

In conclusion, I wish to emphasize the fact that the teeth of the industrial worker and of the man in military service of today were formed, erupted, and possibly destroyed by disease when he was an infant or a comparatively young individual. It would seem to be wise public policy to become exercised at this time over the probable condition of the young men of tomorrow. It seems apparent that the distribution and regular consumption of proper and adequate food among the population, particularly among mothers and young children, is so sensible that there should be little question about it.

Nothing in this statement is intended to suggest that the reparative services of the dentist in private or public health practice is other than a useful, required health service. In fact, the writer is of the opinion that measures for the early detection of tooth decay and its control should be extended. However, the incidence and prevalence of the disease is so vast that every available means should be employed by private and governmental agencies to prevent and control it. In conclusion, it should be said that the food which every individual is known to require for buoyant health is at the same time desirable for dental health. The problem of adequate nutrition for dental health differs not at all from the standards desirable for general well-being.

Vitamin D. Milk in Our Diet

By **Henry T. Scott, Ph. D.**

Director of Biological Research
Wisconsin Alumni Research Foundation
Madison, Wisconsin

As the nutritional program in this country gets under way, increasing attention is being given to vitamin D milk. Our Committee recommends that vitamin D milk be served to school children. What is this new type of milk? What purpose does it serve? Dr. Scott, in the following articles, tells the story of milk fortified with vitamin D.

ANY consideration of the vitamin D needs of the public at large immediately takes into its scope the necessity for the minerals calcium and phosphorus, which are so minutely tied up that the three go together. They are so coordinated in activity that a deficiency of any one upsets the metabolism of all three, and predisposes the individual to a rather disordered mineral metabolism. Such deficiencies do not cause any sudden illness in the individual, but a day in and day out neglect of any one or all three predisposes the human system to an insidious shortage of building materials whose lack may defy early recognition until the damage has progressed to a more acute or critical stage.

Persons of all ages need some vitamin D in addition to that ordinarily obtained by exposure to sunshine for the efficient utilization of calcium and phosphorus. The vitamin acts by increasing the amounts of these substances available for the mineralization of bones and teeth, assuming that the diet is adequate in all other respects.

The requirement of vitamin D may be defined as those amounts which, with ample intakes of calcium and phosphorus and a diet otherwise adequate, insure sufficient retention of calcium and phosphorus to permit:

1. **Normal growth and mineralization of the skeleton and teeth of infants and children.**
2. **Maintenance of bony and dental structures during adult life.**
3. **A sufficient supply for mother and infant during pregnancy and lactation.**

Considering the individual function of each mineral, calcium is necessary for blood clotting, transport of nerve impulses, coordinated functioning of the heart, and water balance. Many cases of tetany or convulsions may be directly traceable to a dietary deficiency of this element. Phosphorus, likewise, plays a prominent role in the regulation of acid base relations in the body, in combination with sugar forms a compound that takes part in muscular

contraction. This process appears also to be involved in the absorption of fat and sugar in the intestines, and resorption of sugar from the kidney.

How vitamin D acts in the assimilation of calcium and phosphorus is not definitely known; however, there is no debating the fact that not only can calcium not be assimilated from the food, no matter how abundant it may be therein, but whatever calcium may have been already assimilated and built into body tissues cannot even be retained in the absence of vitamin D.

Occurrence

Unfortunately, vitamin D is not abundant in most foods except for a small relatively unimportant amount found naturally occurring in egg yolk, milk, butter, cheese, and other dairy products. This vitamin is the rarest known of all. Calcium likewise is scarce (except in dairy products); it is, therefore, necessary that it be efficiently assimilated and conserved. When it comes to phosphorus, a deficiency of this mineral is rarely met in the American diet for the simple reason that it is so well distributed in foods commonly consumed—meat, milk, fish, eggs, cereals, etc.

Sources

Although it was known for years that fish liver oils were effective antirachitic agents, the actual reasoning did not really begin to unravel until after World War I in 1919, when a European investigator, Huldschinsky, associated disordered calcium metabolism with radiant energy. Previous to this, it was thought to be due to a number of different things, such as faulty hygienic conditions and the like. The underlying picture was still more clearly understandable shortly after the early twenties when McCollum definitely identified a vitamin shortage as the agent predisposing to much of the difficulty. This factor was called vitamin D.

With development of the knowledge that a vitamin deficiency was the agent causing rickets in children and calcium disorders in adults, the universal ingestion of this factor in some of the commonly known fish oils naturally followed. Intensive research programs in many institutions throughout this country furthered the knowledge of this malady, and one of the pioneer investigators in the field of pediatrics, the late Dr. Alfred F. Hess of New York, reported that well over one-half of the white and three-fourths of the colored children were affected to some degree, at least, due to a shortage of vitamin D. Dr. Hess, after trying many things in combatting the disease, due to faulty mineral metabolism—such as fish oil, ultraviolet light, and sunshine in controlled diets, was not satisfied with the progress made in spite of the known methods of treatment. In his own words, he postulated that an automatic treatment of some sort was to be desired if the apparent suffering was to be alleviated.

A decided impetus came about in 1923, through the discovery of Steenbock, who demonstrated that it was possible to incorporate in

foods and oils the sunshine vitamin simply by exposing them to the ultra-violet rays of a quartz mercury, carbon arc, or other type of ultra violet lamp—thus was the irradiation process born. This discovery stimulated further research in this field; however, its real worth was not felt until beginning about in 1930.

The importance of this discovery was at once apparent, for here was a method of getting the vitamin in the food supply which could serve as an automatic in the prevention of rickets in children and calcium disorders in the adult. The natural efforts were next turned to the most logical food for vitamin D enrichment; practically every authority in the field agreed that milk was ideal because of its balance in many of the sought-for nutritional qualities, and the optimum relation of calcium and phosphorus. The ratio of calcium to phosphorus in milk is (1.0 to 0.65) about two to one, and for calcium assimilation in the presence of vitamin D, this is ideal. Furthermore, milk is the best known food source of calcium and phosphorus available in the long list of foods we have to choose from. One quart daily takes care of the entire calcium needs and most of the phosphorus requirements; however, the real danger of mineral shortage is quite apparent especially as calcium may be concerned, if milk is not featured in the daily diet. With the desirable mineral balance, one can readily see why so much attention was devoted to milk as a carrier for vitamin D. Here was the ideal food to enrich, the automatic preventive. Vitamin D milks are now established as staple commodities in the United States. Since the appearance of the first vitamin D market milk in 1931, these biologically activated milks have been approved by physicians, nurses, and dietitians, sanctioned by health departments and food and drug officials, endorsed by medical milk commissions, and consumed by the public in ever increasing amounts. Vitamin D milks have been the subject of extensive laboratory and clinical investigations. In fact, well over forty separate references to clinical studies on vitamin D milks might be cited. All of these concluded favorably as to its merit and virtues. The first irradiated milk to appear on the market was a dried milk product (Dryeo) in 1927. This resulted from an intense laboratory investigation by Dr. G. C. Supplee of the Dry Milk Co., who in cooperation with Dr. Hess later made the clinical observations.

The first commercially distributed vitamin D fluid milk (1931) was a certified milk which had been naturally enriched by scientific feeding of cattle at the Walker Gordon Farm, Plainsboro, N. J. This was accomplished by incorporating irradiated yeast in the diet of the cow. In late 1932, a method for addition of concentrates to milk was devised, and about this time was commercially adopted. This development resulted from a discovery made by Dr. Theodore F. Zucker of Columbia University in 1928, who patented a process for extracting vitamin D from cod liver oil and other substances. Irradiated fluid milk was first commercially adopted in the City of Detroit during the month of January, 1933.

Since the early achievements above noted, vitamin D milks have made steady and continuous progress—the curve has been ever upward. The methods most adaptable to the average dairy are irradiation metabolism (yeast feeding) and concentrate addition. At least one half dozen concentrates are now being offered for addition of vitamin D to milk, such as Flo-Dee, UVO, Vitex, ARPI, and others. The irradiation process has found wide application by both fluid and evaporated milk concerns. Well over one half of all the evaporated milk produced today is irradiated.

The irradiation process is subject to automatic or meter control just as is the pasteurization process which records energy in the form of heat, whereas the irradiation meter records energy in the form of light.

The yeast feeding process is an excellent method of producing vitamin D milk, as the cow transmutes the vitamin D from the irradiated yeast which is fed twice daily, directly to the milk. This is called metabolized vitamin D milk, and because the animal does the job of conversion, no further processing is necessary. Of all the methods outlined, the latter is, however, the most expensive.

Present Status

Although the growth of vitamin D milks continues, the total amount consumed is far too small, probably not over 8 per cent of the total. The recent spurt in consumption is undoubtedly due to the nation becoming nutrition conscious. While this phase of food enrichment is now ten years old, the surface is still unscratched. Many of the cities of 50,000 population or less do not feature this excellent product; some concerns are reluctant to consider such a venture until forced to do so by competition. Then, because of being forced into it, attempt to belittle the product rather than do a capable educational job among their consumers. In most markets, vitamin D milk sells for a one or two cent premium over a similar product not so treated. While it is apparent that this product can be successfully merchandised with a one-cent premium, anything higher than this is a definite deterrent as it becomes a luxury to low income groups which they definitely do not purchase no matter how nutritious it may be.

Future Possibilities

No one in this day and age should be ignorant of the virtues of milk in the diet, because no other food fortifies and balances the diet at so many points. Man could ill afford to discontinue the use of milk, if for no other reason than its calcium, riboflavin, and vitamin A contents, not to mention the many other factors that are extremely important in helping balance the diet. When one considers that milk is ideal in ratio and amounts of the mineral upon which vitamin D acts, it is deplorable that more of this combination is not available to the consuming public.

For rural communities, it is true that some other method will have to be found; perhaps the answer here is the vitamin D enrichment of cereals which are consumed with milk. However, for the urban population, it is extremely desirable and becomes automatic. We just make our most complete food more perfectly balanced; it gets away from the idea of self-medication, and there is no attendant flavor or taste connected with this development.

Although no one will deny that vitamin D is the scarcest of all the vitamins in nature, and extensive perusal of Weather Bureau statistics attest to the inadequacy of sunshine, yet many authorities treat this vitamin with utter disrespect when it comes to adult needs. Since the function of vitamin D is so thoroughly established for infants and children, we may well take that part of the subject for granted as beyond debate. One is inclined to take issue, however, with the glib tendency to take vitamin D for granted in the adult diet. Nutritional surveys among adult populations, frequently elaborate in other respects, sometimes skip lightly over vitamin D.

Nutritional charts published by various concerns in a meritorious effort to cooperate with the national nutrition program, frequently fail to mention vitamin D at all, whereas all other well recognized vitamins, as well as commonly known and necessary minerals, are featured.

The most likely reason for this is that since vitamin D is practically absent from all common foods, there would be nothing but blank spaces opposite each food. Since such charts are to aid the nutritionally illiterate over their first hurdles, it seems wrong to minimize the importance of vitamin D, thereby establishing an incorrect notion which later becomes difficult to eradicate.

Considering how few adults aside from pregnant and lactating mothers take vitamin D, and considering how little vitamin D is found in common foods, one is led to the inevitable conclusion that there may very well be widespread vitamin D deficiency in the United States, with a starvation for calcium the result. However, deficiencies in the adult are slow and insidious in development, and difficult in their early recognition. The literature is not without reference to such maladies as senile osteoporosis, where orthopedic surgeons have long been aware that many older patients show extreme degrees of demineralization of the skeleton. Many individuals develop this deficiency before the age of 50. Symptoms oftentimes may be so indefinite that skeletal demineralization is unrecognized as a cause of the patient's lack of vigor or premature senescence. Dr. Black and associates of Mayo Clinic (J.A.M.A., Dec. 20, 1941) have recently emphasized the relationship of calcium, phosphorus, and vitamin D in connection with this problem. Dr. McCollum in "Newer Knowledge of Nutrition" states: "Adults need vitamin D to prevent brittle, easily broken bones."

Dr. Drake of Toronto says: "The literature of the decay of teeth, osteomalacia, etc., gives definite evidence that vitamin D is necessary through the whole of life." Here then is a fertile field for the

future, a place where much needed nutritive aid is sorely desired. Those that may now be consuming milk in recommended quantities risk the danger of not properly utilizing the minerals calcium and phosphorus if the product is not vitamin D enriched. The place vitamin D milk holds is unique considering that this entire nutritional phase could be adequately handled through one food source. That it is of paramount importance to people of all ages is beyond debate.

The Federal Security Agency, the branch of the Federal Government responsible for the setting of standards (Food and Drug Administration) realized the necessity of regulations, which were promulgated in accordance with the revised Federal Food, Drug, and Cosmetic Act of 1938. Known vitamins were classified as to their needs and requirement for people of all ages. Included in this were standards for vitamin D and the minerals calcium and phosphorus, which go to complete this picture.

One of the earliest hearings which took place under this new act was for the purpose of setting a standard for evaporated milk in as much as nothing may be added to any food unless defined in the standard for any given product. The order finally adopted provides for the incorporation of vitamin D in evaporated milk, describes how such products shall be labeled, and the minimum unitage permissible. Recognition by the Federal Security Agency of the needs for calcium, phosphorus, and vitamin D in all age groups should be evidence enough in itself that the three nutritive entities outlined in this thesis are of first order in importance. However, due recognition in many quarters has as yet not taken shape.

As this subject is surveyed, it is true that a number of fundamental questions remain unanswered. In fact, we must watch ourselves lest we arrive at the dangerous conclusion that, since science has not yet solved all the mysteries about this vitamin, we may as well forget about it until science has all the answers. The reply to this is that we cannot afford to forget about it, for nature never forgets and the bill for forgetfulness may come high when it is finally rendered.

Vitamin D Milk in Our War Effort

Recently two articles appeared in the Journal of the Amer. Med. Association — one entitled "Nutritional Aspects of Feeding an Army" very carefully considers the Army's needs as to nutritive entities, but nowhere in the article is vitamin D mentioned. The second article is entitled "Nutritional Aspects of Feeding in the United States Navy." This, too, is an excellent review but makes no reference to vitamin D anywhere. **In contrast, the Canadian Army requires vitamin D to be part of the soldier's diet in the form of irradiated evaporated milk.**

This type of unconcern was previously mentioned when Vitamin D was considered under future possibilities. The tendency to take this factor rather glibly and skip lightly over its importance is still

not going to assimilate the calcium in our diets or take care of the nearly $\frac{1}{4}$ teaspoonful (1000 mgs.) that the body daily needs (exact needs 750 mgs. daily).

Great activities on the nutrition front, particularly by the Federal Security Agency, have emphasized that this country is definitely in need of rehabilitation. Probably the reason for this was rudely called to our attention when the first million men were examined for Selective Service. It is well known that over 33 per cent were rejected according to the early Army standards—a really shocking finding as to physical weakness in a supposedly strong nation, a land of plenty where surplus food was the chief worry. This occurred in spite of the great advances made in the science of nutrition. It is common knowledge that we were no better off than we were in 1918—in fact, if anything, might be a little worse.

As to what relation this has to the present discussion, it should be emphasized that of the first million selectees called 188,000 or 20.9 per cent were rejected for dental defects, 61,000 or 6.8 per cent were rejected for musculo-skeletal defects, 36,000 or 4.0 per cent were rejected for defects of the feet. Now all of these defects may be directly related to the minerals calcium and phosphorus. They have a direct influence on the building of strong, sturdy, sound bones and teeth. However, it must be recalled that these minerals must be supplied the body regularly, and milk is the superior food with respect to these items. Furthermore, absorption and assimilation depends upon the presence of vitamin D—surely the best argument in the world for the combination of vitamin D with milk and insistence upon its consumption in the daily diet.

It would seem that regardless of the battle front we are serving upon, it would be in the interest of all to see that the needs of all are attended to; it is not difficult with such a simple combination as vitamin D and milk. That this is needed in many of our industrial plants today cannot be emphasized too strongly, when many workers on the night shifts hardly ever see the meager sunshine that is supposed to supply their vitamin D. Those on day shifts must be out basking in the sunlight at a particular time, and preferably in June, July, or August, as the actinic ray does not seem to be very effective during the balance of the year.

With respect to industrial workers, surveys have revealed rather deplorable conditions concerning protective foods; in some instances a combination of several nutritional inadequacies showed up. In some test cases where simple in-between milk lunches were supplied, absenteeism was reduced 39 per cent, accidents decreased 30 per cent, errors lowered 8 per cent, and production increased $4\frac{1}{2}$ per cent—a truly great improvement with nothing but the slightest effort. It would be interesting to learn how this picture could be further improved by assuring completeness and diet adequacy. It should not be overlooked, however, that milk, the most perfect of all our foods, was the main item. Vitamin D in this would render the product more complete, and should we not go all the

way while we are at it, for diets which are poor enough in one factor to lead to a nutritional deficiency are most likely to be poor in several other factors as well.

Conclusion

This country is badly in need of rehabilitation. We must build for the future. The dairy industry will play a major role in any plan regardless of who the engineer may be. With the elevation of milk consumption to the deserved level, and the inclusion of vitamin D therein, the tools for relegating disorders due to lack of calcium, phosphorus and vitamin D to the categories of medical curiosities, are at hand.

Bio-Assay of Vitamin D Milk in New York State

1. Under the state sanitary code, bio-assays must be made semi-annually.
2. The dealer pays for the bio-assay.
3. Bio-assays must be made in laboratories approved for the purpose by the Commissioner of Health.
4. These laboratories are private (not state or local health department owned).
5. The laboratories which have been approved are:
Albany Medical College, Albany, N. Y.
Vitamin Testing Laboratory, 76 Madison Ave.,
New York City
Ford Research Laboratory, Long Island City,
N. Y.
Research Division Laboratory of The Borden Co.,
Bainbridge, N. Y.
Fleishman Laboratory (Standard Brands), 819
Grand Concourse, New York City
Peekskill Biological Laboratory (Standard
Brands), Charles Point, Peekskill
6. Samples are collected under arrangement with local health department (usually by Western Union).
7. The State Division of Laboratory and Research is in charge of Bio-assay of Vitamin D Milk.
The State Bureau of Milk Sanitation is in charge of Administration of the regulation.

Reprinted from the Saturday Evening Post, April 24, 1943.

We Can Curb Tooth Decay

IN PORTLAND, OREGON, and San Diego, California, representative groups of children underwent a special kind of medical test. The two sets of youngsters might have looked much the same to a casual observer, but one striking difference became apparent to the examiners. For 95 per cent of the Portland children showed some of the symptoms of rickets, against 73 per cent of the San Diego group. And more than twice as many of the San Diego children had no decayed teeth.

Why? San Diego, located farther south, gets about 3000 hours of sunlight a year, compared with 2200 for Portland. And the sun's ultraviolet rays convert certain substances in the skin into vitamin D, essential for turning the calcium and phosphorous we get in our food into strong teeth and bones.

This is no isolated example. Army rejection rates for defective teeth—which accounted for 20 per cent of the first 1,000,000 rejections in this war—are highest in the New England States and lowest in the South; the Army has had to institute the expensive practice of rehabilitating draftees' teeth whenever possible. A nation-wide survey of more than 500,000 children showed that tooth decay decreased in areas receiving more sunshine.

This same study also revealed that the proportion of poor teeth was greater in the larger cities, which have more impurities in the air—and higher buildings—to obscure the sunlight. Nature evidently intended us to get our vitamin D from the sun, for none of our ordinary foods—not even milk—contains enough to meet minimum needs. But generally speaking, it just hasn't worked out, with the sun's effectiveness being



diminished by such obstacles as clothing, clouds, dust and smoke.

The only answer is to add vitamin D to the diet. Infants generally get it in the form of fish-liver oils, although this is usually discontinued by the time the child enters school. The dairy industry is increasingly going in for the addition of vitamin D to milk, which, "of all the common foods available," according to the Council on Foods of the American Medical Association, "is the most suitable as a carrier of added vitamin D."

This was recently tested among a group of school children near New York City. All got the same basic diet—with vitamin D being added to the milk of one set. Tooth decay increased twice as fast among those who drank ordinary milk as among those who drank the vitamin D kind.

—STATE SEN. THOMAS C.
DESMOND.

Chairman, New York State Joint Legislative Committee on Nutrition.

Reconstituted Milk

By Sub-Committee of the Committee on Public Health Relations of the
New York Academy of Medicine¹

A distinguished group of doctors, under the chairmanship of Dr. Haven Emerson, gave considerable study to reconstituted milk. The report of the doctors is printed below because reconstituted milk may play an important role in the war and post-war era.



Butterfat, skim milk powder, salt and water
are converted into butter

Definition

RECONSTITUTED milk is a fluid resembling ordinary milk in appearance and taste; it is prepared from butterfat, dried skim milk and water by means of emulsifying apparatus. When prepared by exposure to temperatures of 150° F. or less, skim milk powder preserves its emulsifying qualities. Such low temperatures cannot be used in the process of drying whole milk since lipolytic enzymes are not destroyed at these temperatures and they react on the milk fat with a tendency to the development of rancidity. Temperatures above 175° F. are necessary to preserve the fat of dried whole milk in the powdered state. High temperatures coagulate the milk proteins and make them insoluble. The particles remain suspended in the water and the taste of the milk is objectionable. For this reason whole dried

¹ The report was approved on April 6, 1942, by a sub-committee consisting of HAVEN EMERSON, Chairman, F. ELMER JOHNSON, SAM Z. LEVINE, A. A. WEECH, H. B. WILCOX, E. H. L. CORWIN, Secretary.

milk and evaporated milk are unsatisfactory as beverages. The term "reconstituted milk," therefore, as used here, refers to a palatable emulsified fluid made of butterfat, of skim milk dehydrated at a temperature of 150° F. or below, and of water.

Comparison with Fresh Milk

Analysis of the reconstituted milk supplied us by Dr. Charles E. North were made in the laboratories of two of the members of the Subcommittee. These bear out the evidence of other laboratories that the chemical and nutritional components of reconstituted milk are the same as of fresh milk except that there is a diminution of vitamin C. The pH of the milk as well as the mineral content, although varying slightly from sample to sample, appeared to correspond with those in fresh milk.

The methods of production of reconstituted milk are wholly susceptible to adjustments with regard to the amount of butterfat in the milk and as to sanitary requirements. Reconstituted milk can be pasteurized in the same way as ordinary milk. The quality of the constituents of the milk can be adequately supervised. In other words, nutritionally, chemically, and bacteriologically, and by taste, reconstituted milk can be made the equal of natural milk. In saying this the Subcommittee is not concerned with the question of whether or not reconstituted milk should be encouraged where ordinary milk is available in adequate quantities to meet the needs of the community.

Field of Usefulness of Reconstituted Milk

The greatest field of usefulness for reconstituted milk is in areas removed from dairy cattle regions, in sub-tropical and tropical climates, and on ships and in army cantonments under war conditions. It can be used as a subsidiary supply in large communities during periods of milk shortage, and, if it be true that it can be sold at much lower prices than regular fluid milk, its availability to people of small income may become a matter of considerable importance.

By dehydrating skim milk and storing it for future use during the spring and early summer when milk is particularly abundant and rich in butterfat, the national economy is improved and wastes are eliminated. It must also be borne in mind that reconstituted milk can be made anywhere by the use of proper apparatus and thus the need of shipping water in milk is obviated.

Experiments with Reconstituted Milk

During the latter part of World War I the subject of milk dehydration and of milk reconstitution aroused great interest. Experiments in the use of reconstituted milk were carried out, including clinical tests at the Babies' Hospital in New York and

elsewhere. The experiments showed that adults as well as babies can thrive on reconstituted milk made of properly safeguarded ingredients.

Summary

In recording its approval of reconstituted milk, the Subcommittee does not endorse any particular type. The ingredients may comprise different varieties of dehydrated skim milk and different types of butterfat, whether it be melted butterfat, or sweet butter, or plastic cream, or butter oil, the latter being preferable because of stability under practically all conditions of storage. The main considerations are that the milk be safe, nutritious and palatable.

Whether or not the claims are true that reconstituted milk of good quality can be produced at a cost considerably below that of ordinary milk is a matter on which the Subcommittee has no valid opinion to offer.

Recommendations

The Subcommittee recommends:

A. That the Academy endorse the use of reconstituted milk in those areas where natural milk of proper hygienic standard is not easily obtainable, provided that:

1. When sold, reconstituted milk be adequately labeled to distinguish it from other milks;
2. Reconstituted milk conform to the chemical and bacteriological standards required of fresh milk; and
3. The skim milk used in reconstituted milk be dehydrated at a temperature of 150° F. or less.



The School Milk Program

By Robert A. Hanson,
United States Department of Agriculture

As this report is being printed, the whole school milk program is threatened by the possibility of the withdrawal of federal aid. Our Committee believes that the school milk program should not only be continued but should be extended to the many schools not now covered.

THE purpose of the school milk program, from an agricultural viewpoint, was, from its inception in 1940, two-fold. First, it offered an additional outlet for milk which would otherwise go into surplus uses. Consumption of the milk by school children would increase overall returns to producers. Second, and probably most important, it offered a practical method of developing the habit of milk drinking among children at an age when they are most receptive to such development. This in turn creates future markets for producers.

In addition to producer benefits, the program had a definite place in the field of nutrition. The public today is unquestionably conscious of the nutritional aspects of the human diet, but this has not always been so. As a nation, however, we have always recognized the benefits of milk in our diet. The first settlers suffered from lack of this commodity but by 1800 there were more than 6,000,000 dairy cattle in the nation. In 1842 a "historic, scientific and practical essay on milk" was written and received widespread attention. In 1872 this commodity was referred to as the "most perfect single article of food in the whole realm of nature, perfectly fitted to sustain nature." In 1923, Herbert Hoover, in an address before the World's Milk Congress, said, "Upon the milk industry depends the very growth and virility of the white race." Today every leading publication on child care and development puts milk as the first article in diets. And today we are the leading milk producing country in the world.

There are other thousands of people who have labored in the interest of public health, who wrote and taught in the same interest,

but who will probably never be properly credited with their part in the development of this industry.

Perhaps the decade from 1930 to 1940 will be lost in historical perspective, but all of us know it as a period of almost unbelievable paradoxes. The dairy industry offers no exception. During that 10 year period the index of farm price of milk in New York was never equal to, and was often ten to fifteen points lower, than the index of dairy farm costs, using 1910-14 as the base period. Thus, an industry vital to the health and welfare of the nation was operating at a loss!

That the New York State Legislature recognized the problem is evidenced by the fact that since 1934 provisions have been made for a fund to be used in the promotion of milk use.¹ This was perhaps the first instance of its kind—a State urging its people to drink more milk by formal sponsored promotion. At the same time it offered clear recognition of the facts that consumption had decreased and production had increased—and that something had to be done about it. Milk can't be turned on and off at will—cows just aren't made that way.

Other states, and also the Federal government, have tackled this same problem. The various programs and legislation are now a matter of record. But it was not until late 1939 and early 1940 that plans for school milk programs were made by the Federal government. In May of 1940 a program was inaugurated in selected schools in Chicago. In cooperation with local officials, producers, distributors and educational authorities, a plan was adopted whereby milk was made available to all children in selected schools at one cent per half pint. The Federal government paid all administrative expense as well as all costs of delivering the milk to the schools. The pennies collected were used to help defray the expense of the program. Producers were guaranteed a negotiated price, this price being higher than the secondary class prices but lower than the prevailing Class I, or fluid, price of milk.

The program received national attention and was soon extended to over twenty metropolitan areas. New York City inaugurated the program in the fall of 1940.

Expansion of the Program

Because of administrative and other expenses it was not possible to expand to smaller areas. By this time, however, people throughout the country were requesting information and expansion-producers, nutritionists, educators, public officials and others. The general milk price situation warranted such action. In June of 1942, the docket governing the operation of the program was amended by Secretary Wickard to permit the requested expansion.

¹ The fund was eliminated by act of the 1943 legislature.

Under this new docket, the Agricultural Marketing Administration was permitted to act for the Secretary and to enter into operating agreements with local sponsors. By the terms of such agreement, the local sponsor was allowed to select the schools as well as carry on negotiations with distributors for servicing the selected schools. Because of this responsibility, great care was exercised in selection of sponsors. Only a recognized group or agency could act in this capacity.

In addition to local sponsorship, four other major changes were made in the operation, namely:

1. The Agricultural Marketing Administration guaranteed producers the full Class 1 price for milk used in the school programs, rather than a lower, or negotiated price.
2. The sponsor was permitted to charge the usual one cent per half-pint, such collections to be applied by the sponsor to the cost of processing and handling the milk. But if these latter costs exceeded the amount collected, the sponsor was required to make up the difference.
3. The distributor billed the local sponsor for all milk delivered to the school, showing the price paid the producer, and the handling and processing cost as separate items. The sponsor in turn billed the Agricultural Marketing Administration for the cost of the milk—f.o.b. the processing plant.
4. Expansion of the program was limited to rural areas—or areas having a population of 10,000 or less. This limitation was removed in December, 1942.

School Milk in New York

Announcement of the expansion to rural areas was made in June, 1942. A number of non-profit summer camps for children participated in the program in 1942, and as a result of these operations the program was altered slightly.

By the beginning of October, 1942, applications for participation in the program were mailed to various schools and agencies. In the meantime, Agricultural Marketing Administration representatives had called on various interested groups through the State and explained the program. Conferences were held with health, welfare, educational, agricultural and nutritional groups, as well as civic clubs and associations. The program received the unanimous endorsement of every group contacted and each one forwarded informational material throughout the State to their member groups and associates.

By December 1, 1942, three hundred and fifteen schools, having a total enrollment of almost 90,000 children, were participating

in the program in up-state New York. The number of programs, by counties, were as follows:

Albany	(4)	Essex	(15)	Monroe	(2)	Saratoga	(3)
Allegany	(4)	Franklin	(17)	Niagara	(8)	Schenectady	(1)
Broome	(2)	Fulton	(9)	Oneida	(10)	Schoharie	(4)
Cattaraugus	(9)	Greene	(11)	Onondaga	(6)	Seneca	(5)
Cayuga	(3)	Hamilton	(4)	Ontario	(9)	Steuben	(2)
Chautauqua	(22)	Herkimer	(6)	Orange	(5)	Tioga	(1)
Clinton	(22)	Jefferson	(6)	Orleans	(3)	Warren	(4)
Columbia	(13)	Lewis	(5)	Oswego	(2)	Washington	(2)
Dutchess	(1)	Livingston	(6)	Putnam	(2)	Wayne	(15)
Erie	(36)	Madison	(15)	Rensselaer	(17)	Wyoming	(5)

As mentioned previously, New York City began its School Milk program in the Fall of 1940. This metropolitan program is under the direction of the Federal Milk Marketing Administrator for the Metropolitan New York Milk Marketing Area. The area includes, besides New York City, Westchester, Suffolk, and Nassau Counties, and operates in conjunction with other phases of the Federal and State Milk Marketing orders affecting that area. Because of this procedure, certain problems arise which are peculiar to that operation and must be handled as such. By the Fall semester of 1942, 534 schools having a total enrollment of 620,583 children, were eligible for milk at one cent per half pint.

This picture of New York State School Milk programs can be summarized rather briefly. In the metropolitan milk marketing area 620,583 children are eligible to purchase milk at a cost to the child of one cent per half pint. Under present contracts, ninety thousand (90,000) children are eligible to purchase on the same basis in up-state New York, and with the removal of the provision limiting the program to areas with 10,000 population or less, a great expansion is now possible.

Further expansion in Metropolitan New York City is dependent on factors relating to the operation as conducted by the Federal Milk Marketing Administration and must be handled on an individual school basis. Expansion in up-state New York presents a different problem and is treated in more detail below.

This should be preceeded, however, by recognition of a very important and relatively recent development in the milk industry. The over-all price structure has definitely improved. At the same time, costs of production have likewise increased which would tend to diminish the price increase advantage. New production problems have arisen and in some areas shortages seemed imminent. A number of prospective sponsors for School Milk programs have not been able to negotiate satisfactorily with distributors because of such conditions, and others have hesitated to begin a program which might later be discontinued because of shortages. The merits of either of the above reasons are not questioned. The fact that prospective sponsors have been influenced by such conditions is the important thing.

In all fairness to this program and to those persons who have taken such an active interest in its development, the effects of recent lessening of need for price support as well as threatened shortages should be faced promptly. In so doing the following points merit consideration:

Shortages. Should it become necessary to take any steps for handling shortages of milk, it would seem most desirable to give prior consideration to children. Certainly school milk programs constitute one of the broadest methods of assuring the availability of milk for children of school age.

Prices. Although prices have improved, the necessity for developing future milk uses has not decreased. If anything, this necessity has increased as a result of expanded production in the interest of the war effort.

From a nutritional standpoint the need is still apparent. This fact is substantiated by continuous applications from interested groups, who unfailingly express a need for such a program among school children.

Despite the whole-hearted support of the program and the statements of necessity, another factor injects itself into the picture in certain areas. Sponsors have, in instances, found that the costs of handling and distribution, despite the one cent allowance per half pint, are sometimes a deterrent to inauguration of the program. In a majority of these instances however, ways and means have been found to furnish the necessary fund.

VI

Obviously, then, the School Milk Program in New York State has reached a transition stage where all of these changing factors must be considered in charting its future. The difficulties have been mentioned; the recommendations to circumvent them might take one or more of the following forms:

1. In the event that milk rationing becomes necessary in any area, deliveries of milk to schools should be given priority and should be considered as supplemental to the regular ration. This would assure the continued benefits of the school programs and at the same time permit a continuance of home purchases within allowable limits.

2. The adoption by the State of a program to aid in the development of school milk, both from the milk-use and

nutritional points of view, thereby assuring producers in New York of maximum benefits as well as fullest utilization of the potentialities of the program. (Several state agencies have taken an active interest but none has been delegated the specific responsibility).

3. Consideration of state assistance in areas financially unable to meet sponsors' contribution to the program.

Definite action along the lines suggested would assure milk for the children, with attendant benefits to their health. At the same time it would expand the consumption of milk in fluid form—a desirable objective both economically to the producers and nutritionally to consumers.



The School Lunch Program

By Thomas C. Desmond

Chairman, New York State Joint Legislative Committee on Nutrition

The school lunch program faces a crisis. As this report goes to press, federal aid may be withdrawn from school lunches. Many communities are heroically attempting to stave off the closing of school cafeterias by enlisting the volunteer help of mothers and fathers. But, as the following article points out, such assistance can be only a stop-gap procedure. Will our country fail our children?

TODAY the school lunch program which provided hot nourishing noon meals to 6,000,000 school children last year is being menaced. Already, some schools have shut down their cafeterias. Already schools throughout the country have been forced to "simplify" their meals, or in blunt words, to cut down the amount of food served. And field agents of the federal government report that most schools are questioning their ability to keep their feeding activities going when the fall term begins.

The school lunch program was a joint federal-local partnership, in which Uncle Sam provided WPA labor and surplus foods while local boards of education, civic associations or individuals furnished the equipment and small amounts of additional food.

Unfortunately, the program got off on the wrong foot, for it was primarily conceived not as a means of providing a balanced diet to the 9,000,000 school children whom United States Surgeon General Thomas Parran estimates are suffering from hidden hunger, but rather as a means of disposing of a "surplus" of agricultural commodities and a "surplus" of labor. Now that such "surpluses" have been depleted and shortages have become acute, the school lunch program is being given the run-around.

The crisis which confronts the school cafeterias began when the WPA was abolished this year. WPA labor had been used in 30,000 schools to help prepare and serve 2,500,000 meals a day. Withdrawal of WPA assistance struck a smashing blow at the lunch program. In New York State alone, WPA labor employed in feeding pupils amounted to \$2,000,000 a school year. Now the entire financial burden has been thrust upon the local communities. Many of the localities that need the lunch program most can least afford to pay for it.

The second blow at the pupil feeding activity came when the federal government announced that surplus foods were no longer available for distribution to schools. The Food Distribution Administration, in an effort to offset the deepening crisis which faced the schools, declared that it would grant between 5¢ and 7¢ for each meal served to pupils. Unfortunately, the allotments were so entangled in a mesh of red tape that most schools that needed the money never received it. The FDA simply did not have enough personnel to enter into individual contracts with each school. Recently, the FDA wired its regional directors to discontinue immediately entering into further negotiations with the schools. The schools were left without federal funds for food.

Particularly discouraging is the attitude of Congress. The House of Representatives has cut from the appropriations for the forthcoming fiscal year all aid to school lunches. If the Senate approves this slash, thousands of schools will be unable to open their cafeterias in the fall, millions of children will be told: "Go home for your lunch, if you can, or once more bring your cold sandwiches to school."

The difficulties which the school lunch program has been having are intensified by the laws of many states which forbid communities to subsidize the school cafeterias. In addition, many localities that are able and willing to employ their own labor for the cooking and serving of lunches are finding it impossible to secure help, particularly since school boards have never been known for their liberal wage scales. The OPA has complicated matters further by refusing to allocate special priority to schools in the purchasing of food. This policy has forced the schools to compete

for food with gin mills, road houses and honky tonks, all classified as "institutions" by OPA regulations.

In contrast to our own treatment of the school lunch program, England has during the present war expanded its school feeding activities. The Board of Education grants up to 95 per cent of the cost to local education authorities, and with the cooperation of the Ministry of Food is pressing for enlargement of school lunch activities. Miss Margaret Denhardt, rationing expert and special assistant to American Ambassador John G. Winant, in a report to the New York State Joint Legislative Committee on Nutrition has stated that England not only gives the schools priorities in the purchase of rationed food, but also aids them in securing special allowances of non-rationed food.

Until this year, the school lunch program in our own country was expanding rapidly. In 1942, one out of every five pupils received a daily nourishing meal at school. Propped up by federal aid, even the backward southern states went all-out for school feeding. In Louisiana, nearly every school had a lunchroom. In Virginia, one out of every two pupils were served a hot lunch daily. And in New York State, nearly half a million children were covered by the program. The youngsters paid, if they could afford it or were given the meals free if they were needy. For example, in a typical rural school, pupils who could not afford the maximum charge of 10¢ were permitted to pay 5¢, and those whose parents were needy received the lunch free.

The current threat to the school lunch programs comes at a time when so many mothers are working in war plants and are doing well if they can provide an adequate breakfast and dinner for their children. Families are living in crowded boom centers in single rooms and trailers with inadequate cooking facilities. And many families have not had their incomes boosted; in 1942, four out of every ten families, it is estimated, earned less than \$25 a week. With price ceilings that leak, how much nourishing eggs, milk, meat and vegetables can be bought for the children by the low-income families, even when they know the essentials of a balanced diet?

Every survey made indicates the appalling amount of malnutrition that exists among our school children. An investigation of 1,346 pupils from different economic levels revealed recently that less than half were getting the amount of energy foods and proteins they needed; only half were getting the iron, vitamins A, B₁, B₂, and C they required; but one-fourth of them were getting the calcium they should have had. And just as examinations of school children reveal startling neglect on the nutrition front, just so do surveys show the amazing effect of the school lunches. Everywhere that studies have been made, the school lunch pupils have gained more weight and improved their nutritional status more than those who ate lunch at home or brought sandwiches to school.

But the best evidence of the value of school lunches is provided by the teachers and principals who, seeing the program crumbling,

have taken their own hard-earned money and used it to provide lunches for their pupils, and by mothers who have said: "Rather than have the program end, we'll go to school each day and cook the meals and serve them and wash the dishes." In school districts large and small, fathers have gone to local civic groups and pleaded for funds to keep the program going so that the children of the community could have a decent lunch.

And while stop-gap volunteer activities have in some communities assured continuation of the school lunches until the end of the spring term, there can be no permanent lunch program until Congress and the President issue a firm expression of national policy that it is the will of our people that every child have an opportunity to secure a hot, balanced lunch at school. Toward the fulfillment of this goal, a five point program must be instituted:

1. The federal government should contribute substantial sums of money to help support the school lunches.
2. Each state should contribute a share of the funds and supervise the administration of the lunch program.
3. The states should repeal legislation which bans school boards from subsidizing cafeterias.
4. Local communities should pay part of the cost of the lunch program, not by begging contributions from individuals and civic groups, but by regular annual appropriations from boards of education.
5. Schools should be granted by the OPA priorities in the purchase of food, and the FDA should assist in securing special allotments of non-rationed food for the school children.

Is our nation content to have the lunch program end? Shall we neglect our children's diet? Shall we say to our children: "We're too busy fighting the war to bother with you. Get your lunches as best you can." Is this the response the "richest country in the world" wishes to make to its youngsters?



Meet Grace Caston

She is 6—a bright, blue-eyed first-grader in the Highland, N. Y., Central School—one of 5,000,000 beneficiaries of the nation's school-lunch program

They Won't Go Hungry

What school lunches mean to children of Highland, N. Y.—one of 81,000 U. S. schools helping 5,000,000 underfed

By DON WHARTON
Author of LOOK's series on food habits

LAST year 3,000,000 U. S. school children sat down every school day to free meals designed to whip the twin problems of surplus commodities and hungry mouths. This year not 3,000,000 children but close to 5,000,000 will be fed daily. More than two thirds will get the meals free.

By bus, car, bike and foot, these millions of children come to 81,000 schools, 25 times as many as were serving lunches back in 1937. It would take a reporter 476 school years to make a one-day visit to each of these schools.

Let us take a look at one of them: the Highland Central School, at Highland, 100 miles up and across the Hudson from New York City. This school draws 825 pupils from 36 square miles of village and rural hills in the Hudson River fruit district. It is a far cry from city slums or country dust bowls; but, like all America, it had undernourished children—little ones who came to school with only bread-and-potato sandwiches. Their bodies were slowly being ruined.

Then, in the fall of 1940, the Highland Parent-Teachers Association tackled this problem. Soon the Highland school board took some \$1,500 out of general funds, equipped a first-class kitchen, hired an experienced woman to run things. The WPA and NYA provided three helpers.

The Federal Surplus Marketing Authority provides surplus foods: butter, fruits, evaporated milk, dehydrated soups. The paying children provide funds for nonsurplus foods. Thus, from a financial standpoint, the Highland lunches break even. What they mean to Highland from a human standpoint these four pages show. Multiply these pictures by 81,000. That is what school lunches mean to America.



GRACE LIVES IN THIS SHACK in a ravine down by the Hudson River. Last fall she wasn't getting passing grades. Now, with free hot lunches at school, she averages 85. Grace's health has improved meanwhile.



THESE ARE THREE of Grace's four younger brothers and sisters (2 months to 5 years). Her father is a woodcutter. Formerly she took sandwiches to school. Some schoolmates lunched on bread-and-lard sandwiches.



OF GRACE'S 824 SCHOOLMATES, some 500 arrive in busses. They come from an area of 36 square miles, in which tuberculosis is rampant. Half are of Italian descent and have wine instead of milk for breakfast.



Billy Lent

TYPICAL BOY carrying typical tray: meat pie, homemade muffin, butter, cocoa, peach and cookie. Since getting hot lunches, Billy has gained 10 pounds. Average gain among hot lunchers in

his class is five and three quarters pounds. One boy gained 20 pounds. Billy's father, a laborer, is ill—and has eight other children. Sometimes their supper is bread and potatoes.



ELIZABETH HAS OUTGAINED all her classmates—four pounds in four months. In one Southern school, hot lunches in one term reversed weight statistics: from 95 per cent underweight to 98 per cent normal weight.



ISABEL HAS GAINED THREE POUNDS since getting hot lunches. She has improved so in her studies that her teacher advanced her from B to A group. She's 5 years old, a first-grader, has two brothers, one sister.



GERALDINE SITS ACROSS TABLE from Isabel. Her parents came up from North Carolina last year to get work packing apples. She brings money for lunch tickets, stays awake afternoons better than before.



Robert Simpson

ROBERT HAS CONVERTED hot lunches into a place on honor roll of the second grade. His grades have shot up from 70 to 90; his weight has risen from 57 to 62. Teacher says Robert is more alert, more responsive. He has six brothers and sisters; his father is a truck driver on the 100-mile night run to New York.



Rose Miller

AFTER PICKING HOT SOUP, hot cocoa, egg-salad sandwich and peaches and after lunching next to Grace Caston, Rose was ready for the playground. Rose has the prettiest curls in Highland. While she fortifies her body for study and play, Rose's father helps make guns for the Army in a near-by manufacturing plant.



William Minard

HIS TEACHER CALLS WILLIAM one of the best pupils in the fourth grade. His after-lunch geography has improved particularly. Formerly William's classroom attention wandered, and his grades were poor.



Edward Ventullo

HIS FATHER IS IN A HOSPITAL, his mother in a knitting mill. Edward (striped sweater) thrives on hot lunches. His grades have gone up 10 per cent. He is less nervous. Here Edward is in his gym class.



EIGHT AND IN SECOND GRADE, Hazel lost her father, then her mother, but still has self-confidence. By using lunchtime as a social get-together, a Pennsylvania school tried to erase feelings of inferiority.



Better food—and
no social stigma



LITTLE GERALDINE Tatum is buying a lunch ticket from the secretary of Highland's up-to-the-minute school principal, Herbert Campbell. Some children pay \$1 at a time (for five meals); others make part payments in nickels and dimes. Identical tickets are provided to both free and paying children, so that no one is embarrassed.

ALBERT WILKLOW, a fifth-grader (left), leads his first-grade brother, Jimmie, to the cafeteria. From their farm, they bring pails packed with husky sandwiches, milk or cocoa—round out their meals with soup (five cents a bowl). But for the cafeteria, Al and Jimmie would have nothing hot between sunrise and sunset.

School lunches pay dividends in many different ways



HIGHLAND'S CAFETERIA serves 110 lunches a day—60 of them free. The kitchen's capacity is 250—tiny compared with a mechanized one in New York which daily prepares meals for more than 100,000 children.

Highland's experience, multiplied by 81,000, equals the nation's profit from school lunches. They provide work for WPA and NYA employees, markets for farmers, health for children. War may eliminate necessity of work programs and surplus marketing, but it will not reduce the number of children who need proper nourishment. Surveys show that, for every child getting a school lunch, another—equally malnourished—goes to a school without a lunch program. Other facts:

CHILDREN SAY they look forward to this meal. "Best food I eat."

From these lunches many children get their first lessons in balanced diets. They also acquire appetites for protective foods—fruits and vegetables. Doubtless some of their experience eventually seeps through to parents.

TEACHERS SAY school lunches reduce afternoon fatigue, improve grades, increase alertness, responsiveness, power of absorption. One teacher remarked: "I'd give part of my salary rather than see them go back to bread and lard."

DOCTORS SAY it works. Dr. C. F. Meekins, Highland's health officer and school physician (right), says there is less malnutrition. Pupils' weight-height-age ratios are getting more normal. "Less sickness, particularly colds," he says, "than ever before." Long-time benefits will certainly be great.



Physical examinations show that lunches help.



Enriched White Bread—Its Development and Progress

By James A. Tobey, Dr. P.H., LL.D.

Director, Department of Nutrition
American Institute of Baking, New York

Torn from the staff of life as it entered the mill were essential nutrients. Today, all white bread must be enriched. Enriched white bread comprises about 70 per cent of the bread produced in this country, and about 75 per cent of that made in New York State.

PRODUCTION of white breads enriched with vitamins and minerals natural to whole wheat became an accomplished fact in the United States early in 1941. By January of that year standards for this nutritionally improved type of bread had been recommended by a committee of the National Research Council, and practical methods for the enrichment of bread and flour had been developed by the American baking and milling industries.

On May 27, 1941, coincident with the National Nutrition Conference for Defense called by President Franklin D. Roosevelt in Washington, D. C., the new standard enriched white bread became generally available throughout the country. At that time it represented, however, a comparatively small fraction of the approximately ten and a half billion pounds of bread then produced annually by about 20,000 American bakers. By the end of 1941 it was estimated that fully one-third of all our white bread was enriched.

The progress of the enrichment movement, as undertaken for the most part voluntarily by American bakers, is shown by the fact that in the middle of 1942 about two-thirds of all white bread was enriched. At the end of 1942 it was estimated that at least 70 per cent of our commercial bread supply and about the same propor-

tion of our white flour had been enriched.* During this year the consumption of all baker's bread increased to about twelve billion pounds.

The History of Bread Enrichment

Dietary fortification of bread and other foods is not a new idea. As early as 1923 there was devised and produced by a leading baking company a white bread containing all of the vitamins then considered significant.¹ Despite an intensive and costly advertising campaign, this vitamin-enriched bread had a relatively brief career, and finally was withdrawn from the market.

The addition of vitamin D to market milk was inaugurated in 1931, with the result that today somewhat over 10 per cent of all fluid and evaporated milk is thus vitamin-fortified. Breads and cereals containing added vitamin D have also been produced since 1931, although without marked commercial success. Iodine has been added to table salt and drinking water in goiter regions for many years. Within the last two or three years 80 per cent or more of our margarines have been fortified with vitamin A.

The desirability of the vitamin and mineral fortification or restoration of foods, particularly bread and flour, was stressed at a symposium at the annual meeting of the American Institute of Nutrition, held in Toronto on April 26, 1939. Participants in this program, the proceedings of which were published in July, 1939,² included Agnes Fay Morgan, Ph.D., Lydia J. Roberts, Ph.D., W. H. Sebrell, M.D., E. M. Nelson, Ph.D., and Alonzo E. Taylor, Ph.D., representing science, government, and the milling industry.

The proposition for enrichment of foods was also discussed at the Second Food Technology Conference held at the Massachusetts Institute of Technology in June, 1939,³ and at the Pacific Science Congress in Berkeley, California, late in July of that same year. The matter was likewise the subject of an editorial in the American Journal of Public Health for July, 1939.⁴

Further attention was focussed on the enrichment of foods by the publication in August, 1939, of a report by the Council on Foods and Nutrition of the American Medical Association, in which were enunciated certain principles for the restorative addition of vitamins and minerals to foods.⁵ In this report it was stressed that, in general, such additions should be made only to foods which naturally are sources of these nutrients. This report was followed in December, 1939, by an article authorized by the Council, and prepared by George R. Cowgill, Ph.D., on the need for addition of vitamin B₁ to staple American foods.⁶

* "Food Distribution Order No. 1, issued by U. S. Secretary of Agriculture Claude R. Wickard on December 29, 1942, requires that all white bread be enriched, effective January 18, 1943. 'Enriched' is defined as meaning that the bread has been made from enriched flour containing the ingredients in the quantities required by the regulations under the Food, Drug and Cosmetic Act, or that equivalent ingredients have been added to plain flour during the mixing of the dough."



The farmers of America have worked hard to enable us to become the bread-basket of the world

By this time bakers were becoming interested in the possibilities of increasing the vitamin content of bread, and yeast manufacturers had begun to produce high-vitamin B₁ yeasts for this purpose. The writer had suggested in an article in the American Bakers Association Bulletin for August, 1939, that bakers consider the advisability of such improvement in the nutritive qualities of white bread.⁷ Early in 1940 a number of bakers were producing high vitamin B₁ breads.

The matter was further crystallized in September, 1940, when hearings on flour standards were begun in Washington by the Federal Security Agency. Among the witnesses at these hearings were a number of physicians and scientists who advocated that several of the vitamins of the B complex, and also iron, be added to milled flour. During these hearings, which ran over into November, 1940, it was first suggested that the vitamin and mineral reinforced flour be called "enriched", the term which was subsequently adopted.

Then came a historic conference of government officials, scientists interested in nutrition, and representatives of the baking and milling industries, held in Chicago in October, 1940. The principal sponsors of this event were Surgeon General Thomas Parran, Jr., of the United States Public Health Service, Mr. M. L. Wilson of the United States Department of Agriculture, and Dr. Russell M. Wilder, chairman of the Committee on Food and Nutrition of the National Research Council.

At this conference the bakers and millers pledged their cooperation in the plans for improvement in the national nutrition. At meetings of the Board of Governors of the American Bakers Association and the Board of Directors of the American Institute of Baking in Chicago in January, 1941, resolutions were adopted in favor of, "helping to bring about the more general availability of nourishing breads enriched in vitamins and minerals in accordance with government standards". Similar action was taken by the Associated Retail Bakers of America early in 1941.

In the meantime a subcommittee of the National Research Council, under the chairmanship of Dr. Robert R. Williams of New York, was working on standards for enriched white bread. These were issued early in 1941 and were promptly published in pamphlet form by the American Institute of Baking for the guidance of all bakers.

Federal standards for enriched flour sold in interstate commerce were promulgated on May 27, 1941, and became effective (with certain exceptions) on January 1, 1942.⁸ Hearings on standards for bread, including enriched bread, were held by the Federal Security Agency in Washington during the summer of 1941, but no such standards had been issued at the end of 1942. Pending the promulgation of these official standards, the recommended standards of the National Research Council for enriched bread have been generally followed. Most bakers use the minimum standards.

Despite the absence of official federal standards for enriched bread, the labelling of this product as sold in interstate commerce has been governed by federal regulations for "special dietary foods", which became effective on May 15, 1942,⁹ and which have been interpreted as applicable to enriched bread.

State laws requiring that all white flour and bread be enriched in accordance with federal standards, as or when promulgated, were adopted in South Carolina and Louisiana in 1942. The former became effective on August 1, the latter on October 1.

At a Baking Industry War Conference held in Chicago in October, 1942, a resolution recommending the enrichment of all baker's bread was unanimously adopted.

From this review of the historical development of enriched white bread, it is obvious that this important contribution to wartime nutrition and to the public health has been achieved by the joint, cooperative action of government, science, and industry. Each deserves equal credit for this noteworthy accomplishment.

What Is Enriched Bread?

Enriched bread may be defined as white bread, slightly darker bread made from special process flour, or milk bread which contains in addition to the usual ingredients proper amounts of (1) thiamine (vitamin B₁); (2) niacin (a vitamin of the vitamin B complex); and (3) iron. These are required ingredients. Enriched bread may also contain as optional added ingredients proper amounts of (1) riboflavin (vitamin B₂); (2) vitamin D, and (3) calcium.

The standards recommended for enriched bread by the Committee on Food and Nutrition (now the Food and Nutrition Board) of the National Research Council are shown in the following Table:

RECOMMENDED STANDARDS FOR ENRICHED BREAD

	Minimum Mg. per lb.	Maximum Mg. per lb.
a. Required		
Thiamine	1.0	2.0
Niacin	4.0	8.0
Iron	4.0	16.0
b. Optional		
Riboflavin	0.8	1.6
Calcium	300	1200
Vitamin D	150 U.S.P. units	600 U.S.P. units

Since the flour in modern white bread comprises about two-thirds of its volume, these recommended standards for enriched bread represent in general approximately two-thirds of the official standards for these nutrients in enriched flour. The standard enriched bread may, of course, be made satisfactorily by the use of enriched white flour, but in actual practice comparatively few bakers employ that method.

Most commercial enriched white bread is prepared by the use of plain white flour and special enriched yeast, which is available from practically all leading yeast manufacturers. By using the customary amount (1½ per cent) of this yeast, the proper amounts of thiamine, niacin, and iron are imparted to the bread. This method is popular with bakers because of its economy and the fact that it requires no change in the bread-making formula. The cost of enrichment is now a small fraction of a cent per pound.

Another method for making enriched bread, which has found favor with a considerable number of bakers, is by the direct addition of thiamine, niacin, and iron in tablet or powder form to the dough. Tablets containing these ingredients and designed for use with 100 pounds of plain flour are dissolved in the water used in preparing the dough.

The baker may, of course, employ combinations of these three acceptable methods for bread enrichment, and he may also use specially milled flours which contain greater amounts of the vitamins and iron than are usually found in patent flour.

In the official federal standards for enriched flour, riboflavin (vitamin B₂) is a required ingredient, although the date that this particular requirement takes effect has been officially postponed to April 20, 1943. In the proposed federal standards for enriched bread, riboflavin would also be required, although as previously stated, such regulations have not yet been issued.

Riboflavin can be added to flour only in synthetic form. It may be added to bread either in synthetic form or by the use of dry skim milk, which is a good but somewhat variable source of this vitamin. When 6 per cent dry milk solids (on the basis of flour) are incorporated in white bread, the resulting loaf has been reported as containing an average of about 0.6 mg. of riboflavin per pound.¹⁰

The dry skim milk also adds to the loaf calcium, in proper ratio to phosphorus, and proteins of high biological quality. A bread made with 6 per cent milk generally contains on the average about a third of a gram (333 mg.) of calcium per pound. The proteins of such a loaf are "complete", having all of the indispensable amino acids. Milk likewise contributes other desirable properties to bread.

At the hearings on federal standards for enriched bread in 1941, certain desirable changes over the previously recommended standards were advocated by a number of scientists, representatives of the American Institute of Baking, and others. These recommendations were arrived at as the result of more recent developments in vitamin determinations, better knowledge of vitamin and

mineral requirements in human nutrition, data on losses of vitamins in baking, and the realization that use of milk solids in bread making is an effective and economical method of introducing certain necessary nutrients.

The proposed new legal standards for enriched white bread are shown in Table II.

TABLE II
PROPOSED STANDARDS FOR ENRICHED BREAD

	Minimum Mg. per lb.	Maximum Mg. per lb.
Thiamine	1.1	2.2
Niacin	10.0	20.0
Iron	8.0	16.0
Riboflavin	0.6	1.2

So far as is known, there is no appreciable loss of niacin, riboflavin, or iron when bread is baked or toasted. There may be, however, some destruction of thiamine, the amount of this loss depending upon the time and temperature of baking, the acidity of the dough, and the amount and type of ventilation in the oven. Greater losses occur at the higher temperatures over longer periods of time, and in instances of doughs having low acidity.

Investigations indicate that the average loss of thiamine under ordinary baking and toasting conditions is about 15 per cent, but this loss may vary under appropriate conditions from 7 to 35 per cent.¹¹

It should be pointed out, however, that small amounts of thiamine are naturally present in bread, even without the addition of the enriching ingredient. The white flour, milk solids, and other components of bread generally contribute about 0.35 mg. of thiamine per pound of bread, although the precise amount is variable.

Reasons for Bread Enrichment

The enrichment of all white bread with vitamins and minerals is important as a wartime measure and as a permanent contribution to the public health for a number of very significant reasons.

In the first place, bread is a logical carrier of such necessary nutrients as the vitamin B complex and the food-minerals, iron and calcium, not only because wheat is a natural source of these elements, but because bread is a universal, popular, and inexpensive food. Wheat is, furthermore, plentiful in this country, and as other foods become scarce, bread will continue to assume a more important role in the feeding of the American people.

Bread and wheat products now contribute about 25 per cent of the calories in the American dietary, although at considerably less than 25 per cent of the cost of the dietary. Authorities on nutrition recommend that enriched white bread (made with milk) may now safely comprise at least 40 per cent of the calories in the American dietary, provided that the balance of the diet consists mainly of other protective foods such as pasteurized milk, eggs, fruits, green leafy vegetables, yellow vegetables, and meats.¹¹

Most, but not all, of the nutrients of enriched white bread could, of course, be obtained through the consumption of 100 per cent whole wheat bread. The American people are not, however, willing to consume large quantities of such whole wheat bread. Despite the ardent recommendations of nutritionists that more whole wheat be eaten, less than 2 per cent of the flour milled in this country is whole wheat, in accordance with definite public demand.

The amount of 100 per cent or entire whole wheat bread produced in this country is estimated to be less than one-third of one per cent of the total supply. Another 7 to 10 per cent of our commercial bread supply consists of dark breads made from more or less equal mixtures of white and whole wheat flours. Most rye breads are also made from a mixture of flours, in which white predominates. These breads are not, as a rule, as nourishing as standard enriched white bread.

When all white bread and flour in this country are enriched, the intake of thiamine in the American dietary will be increased by 64 per cent or more, as pointed out by Dr. R. R. Williams and associates.¹² Even then the intake of this important nutrient, often popularly known as "the morale vitamin", will be just about adequate. Many investigations have shown that deficiencies of thiamine have existed in the diets of millions of Americans.¹³ In many parts of the country, niacin has also been deficient in the diet, and the same may be said for iron, calcium, and riboflavin.

Enriched white bread provides these important food factors without extra cost to the consumer. When 40 per cent of the daily calories are furnished by enriched white bread made with milk, this protective food provides 100 per cent of the normal adult's minimum daily requirement for thiamine, 40 per cent of the niacin required every day, 30 per cent of the riboflavin, 40 per cent of the iron, 45 per cent of the calcium, and 64 per cent of the protein. This amount of enriched bread would supply slightly less of the recommended daily allowances for these nutrients, as suggested by the National Research Council. The recommended daily allowances are, in general, somewhat higher than the minimum requirements, as set forth in the federal regulations pertaining to special dietary foods.

A one-ounce slice of bread, enriched white, plain white, whole wheat, or rye, yields approximately 70 calories, or units of food-energy. In the United States Army and Navy, where all the bread served is enriched, the average consumption is eight or nine slices a day. Among civilians, it has been considerably less.

Enriched Bread in New York

Nearly one billion pounds of bread are produced annually in New York. In 1942 there were in this State approximately 3300 bakery establishments, including wholesale bakers, retail bakers,

house-to-house bakers, and others, who employ nearly 40,000 wage earners, at an annual compensation of about \$60,000,000.

These bakers produce annually about one and a half billion pounds of bread and other baked goods, valued at a quarter of a billion dollars. Some bakers do not make bread, but only cake, sweet baked foods, doughnuts, and pie. Cracker and biscuit bakers are not included in these figures.

As the result of a survey conducted in September, 1942, by the American Institute of Baking, it is conservatively estimated that at least 75 per cent of all white bread sold in New York is enriched. In New York City, since the general practice is for large bakeries to enrich all their white bread, the proportion is probably over 90 per cent.

Many of the baking companies, both large and small, are enriching all of their white bread. Some are enriching only a portion of this bread supply, although usually a high proportion, while a few are not yet enriching any of their breads.

Enrichment of white bread by a majority of New York bakers is a creditable action which has been undertaken voluntarily by them, and at their own expense, for the benefit of the people served by them.

Public demand for this improved type of bread has been stimulated by educational efforts of the federal government, state and local nutrition committees, health departments, nutritionists, and the milling and baking industries.

Summary

White bread enriched with vitamins and minerals natural to whole wheat—thiamine, niacin, and iron—has been voluntarily produced by American bakers since early in 1941.

At the end of 1942 it was estimated that enriched white bread comprised about 70 per cent of the approximately twelve billion pounds of bread produced in this country by American bakers.

In New York the amount of enriched white bread was estimated at that time as being about 75 per cent of this State's annual production of nearly one billion pounds.

Enriched white bread made with 6 per cent dry milk solids is comparable in essential dietary qualities to the much less popular 100 per cent whole wheat bread, and in some respects, (calcium content, calcium-phosphorus ratio, digestibility, and palatability) is superior.

Nutritional authorities state that 40 per cent of the calories in the American dietary may be safely obtained from enriched white bread.

¹ Tobey, J. A. and Catheart, W. H., Fortification and restoration in the baking and dairy industries, Ind. and Engr. Chem. 33:714-716, June 1941.

² The fortification of foods with vitamins and minerals, Milbank Mem. Fund Quart. XVII:221-262, July 1939.

³ Tobey, J. A., Baking technology and national nutrition, Sci. Mo. XLIX: 464-468, Nov. 1939.

⁴ Edit.: Restoring lost vitamins to the diet, Am. Jour. Pub. Health 29:792, July 1939; also Edit.: More strength for the staff of life, Am. Jour. Pub. Health 30:1359, Nov. 1940.

⁵ Council on Foods, Fortification of foods with vitamins and minerals, Jour. Am. Med. Ass'n 113:680-1, Aug. 19, 1939; also, Council on Foods: Nutritionally improved or enriched flour and bread, Jour. Am. Med. Ass'n 116:2849 2853, June 28, 1941.

⁶ Cowgill, G. R., The need for the addition of vitamin B₁ to staple American foods, Jour. Am. Med. Ass'n 113:2146-2151, Dec. 9, 1939.

⁷ Tobey, J. A., Vitamin B₁ in bread, Am. Bak. Ass'n Mo. Bull. 2:435, Aug. 1939.

⁸ Federal Register, 6:2574-2582, May 27, 1941.

⁹ Federal Register, 6:5921-5926, Nov. 22, 1941.

¹⁰ Tobey, J. A., Whole wheat and enriched breads, Jour. Am. Diet. Ass'n 18: 667-670, Oct. 1942.

¹¹ Sherman, H. C. and Pearson, C. S., Modern bread. From the viewpoint of nutrition, Macmillan, 1942; also Edit.: Modern bread, Jour. Am. Med. Ass'n 118:1218, April 4, 1942.

¹² Lane, R. L., Johnson, E., and Williams, R. R., Studies of the average American diet. I Thiamine content, Jour. Nutr. 23:613-624, June 10, 1942; also Edit., Thiamine in the American diet, Jour. Am. Med. Ass'n 119:1027, July 25, 1942.

¹³ Proc. Nat. Nutr. Conf. for Defense, Federal Security Agency, 1942; also Tobey, J. A.: Vitamin and mineral fortification of white bread, Proc. Inst. Food Tech., 1941; and Jolliffe, N., McLester, J. S., and Sherman, H. C.: The prevalence of malnutrition, Jour. Am. Med. Ass'n 118:944-950, Mar. 21, 1942.

Some Comments on Bread

By Professor Clive M. McCay

School of Nutrition, Cornell University

The following are some interesting comments on strengthening the staff of life. They are taken from a letter of Dec. 23, 1942 to State Senator Thomas C. Desmond, Chairman of the New York State Joint Legislative Committee on Nutrition.

THE average person in this country eats about 6 slices of bread per day. Inasmuch as large numbers of women eat less than this, much of this bread goes into the diet of workers who carry lunches. As a means of improving the nutrition of everyone and especially those who are laboring hard, bread offers a great opportunity. Some objection has been made to improving bread on the grounds that it might cost more. As a whole, however, the consumer would benefit far out of proportion to this cost because when he buys nutrients in the form of bread he should get them at the wholesale prices paid by the baker. Thus skim milk put into

bread by the baker would cost about 14 cents per pound, while if this were bought for direct consumption at a retail store, it might cost twice as much. In the case of vitamin concentrates, the margin is far greater for the consumer, because these tend to move through drug channels at margins of 5 to 10 times the basic cost. For instance, dry brewers' yeast costs 24 cents per pound at the site of production and \$3 to \$4 per pound at the druggists' counter. In a loaf of bread, the cost of dry brewers' yeast should be very near that of 24 cents per pound.

The use of dry skim milk solids up to a level of 6% has been extensively studied. Such a level of milk solids in bread, combined with 2 per cent high B₁ yeast gives a good nutritious product. This problem is discussed in a copy of a recent letter from Dr. McCann, which we are enclosing.

Soybean Flour in Bread

There is an adequate experimental background in nutrition which shows that the quality of the protein is improved by using 5 to 10 per cent of the flour in the form of soybean flour. Thus if you feed rats with a diet containing about 9 per cent of wheat flour proteins, they grow poorly, but if you supplement this flour with 5 per cent soybean flour, the growth is much superior. This merely shows that soybean proteins provide essentials that are lacking in wheat proteins. Furthermore, high fat soybean flour is one-fifth fat. This is important during a period of fat shortage. Our local people have made excellent loaves of bread containing as much as one-third of the flour in the form of soybean flour. We believe the taste of the loaf made from the high-fat soybean flour is superior, although both are very good and make fine toast. Furthermore, these breads containing soybean flour are richer in protein and tend to remain moist longer. This is important in a period when meat supplies may be somewhat deficient in furnishing adequate protein, and in conserving bread due to drying out.

Another item that will have to be considered in case dry milk supplies are inadequate is the addition of calcium salts to bread, as the English are doing.

In general, then, the bread picture breaks down into two parts: the first concerns an open formula to be printed on each loaf of bread, showing its content in terms the housewife can understand. A secondly, the problem is to set up standards for bread and create public demand for them through education. The printing of the content on the loaf may seem novel to city people, but it is readily understood by most farmers, since for 20 years they have been using open formula feeds extensively. By an open formula feed, we mean one that contains not only a list of the ingredients, but also how much of each ingredient is present. Thus it is not sufficient to say that a dog feed "contains liver meal," because we do not know how much. It is

important that the dog feed state "5 per cent liver meal" or whatever the figure may be.

At a meeting of our committee on bread and soybean products here at Cornell University, we decided to start with two specifications for bread, namely, one containing whole wheat flour, and one containing the usual white flour. We are going to try to get loaves produced at the local bakeries containing in addition 5 per cent soybean flour, and if possible 6 per cent dry milk solids and 2 per cent high B1 yeast. We hope to have these products on our market within one month. Through our local cooperative groceries store, which has about 500 members and about 1000 families trading there, we hope to carry on an educational program to see if we can induce the housewife to select her bread upon the basis of nutritive value as well as upon taste and the other common considerations. Within a couple of months we should know how this Ithaca experiment is progressing.

In regard to the action of our committee upon soybean products, we have made arrangements with the G.L.F. to place in the hands of every County Home Demonstration Agent and the Chairmen of the County Nutrition Committees, a few pounds each of soybean grits and high-fat soybean flour, so that these women can get some experience with these products by the time the G.L.F. is ready to market them through the stores. The soybean flour will be useful for both bread and the making of cookies. The soybean grits will be sold primarily as a means for extending the meat supply, with a product that contains a high quality protein.

State and Local Nutritional Activities

THE OFFICE OF WAR NUTRITION SERVICES OF THE NEW YORK STATE WAR COUNCIL¹

THE rapidly growing importance of nutrition as an element of major concern in the State war program and recognition of the need of carrying even further the principles of coordinated effort between the several State departments and agencies which were first voluntarily brought about under the State Nutrition Committee resulted in the creation of the Office of War Nutrition Services by action of the State War Council in June, 1942. The responsibilities assigned to this office were those of coordinating and giving direction to the activities of the several departments and agencies of State government to the extent that they were participating or capable of participating in programs related to the problem of war-time nutrition.

This somewhat new concept in State government is intended to enhance the principle of coordinated effort, the avoidance of duplication, and the promotion of an accelerated program in keeping with the war emergency. It is intended that this office shall embrace certain of the activities of the State Nutrition Committee, the Cornell School of Nutrition and the Cornell College of Home Economics which had been separately supported under allocations from War Council funds. Insofar as possible an attempt has been made, in organizing this office, to utilize the facilities and services of existing State departments and agencies, either on whole or part-time assignment. A small appropriation was made to meet the growing needs of the Office and at the same time the several independent allocations previously made to other State departments or agencies were consolidated under one budget.

Within the War Council structure the Office of War Nutrition Services is a member of the Division of Civilian Mobilization. Similarly a directive from the State War Plans Coordinator has been sent to the local War Councils throughout the State recommending that the local nutrition committee, where such existed, also be recognized as a sub-committee of the Civilian War Services Division. As of January 1, 1943 there were 87 functioning local nutrition committees cooperating with this office. Of these, 60 were known to be officially connected with their local war council.

Following the organizational changes made in June, 1942, a rapid survey of the nutrition problems was made and it was felt that insofar as possible the efforts of all available personnel and of the local nutrition committees should be directed primarily toward the

¹ As this report goes to press, the Emergency Food Commission has absorbed the powers and functions of the office of War Nutrition Services.

problem of obtaining the very best possible nutrition for workers in war industry. Accordingly, a plan for such action was drawn up and presented to the State War Council and approved by resolution on August 29, 1942, being resolution No. 139 of said Council, and reading as follows:

"Resolution No. 139

Industrial Nutrition Programs, State War Council

"WHEREAS, there is evidence that the average American worker, even in normal times, does not receive a diet adequate in protective foods, especially vitamins and minerals, and that the exigencies of war production frequently tend to exaggerate this deficiency; and

"WHEREAS, there is evidence that sub-standard nutrition of the degree prevalent, while seldom causing outright symptoms of disease, may be expected to cause physical conditions which translated into practical values mean that the worker does not enjoy maximal health and vigor, is a poorer risk as regards accident hazards than he need be, and is incapable of his maximal rate of production; and

"WHEREAS, there is highly suggested evidence in both human experience and animal experimentation, in support of the opinion that provision of an adequate diet will result in improved health, personal vigor, and capacity for production in industry; and

"WHEREAS, there is unanimity of opinion amongst outstanding students and authorities in the field of nutrition and a growing acceptance of the urgency for provision in this regard on the part of those responsible for war production; therefore be it

"RESOLVED, that the New York State War Council shall call upon all persons concerned in any way with war production to adopt and put into immediate effect all possible measures for providing adequate nutrition for our war workers upon whom so much depends; and be it further

"RESOLVED, that the Office of War Nutrition Services of the New York State War Council is empowered to act as the agency of this Council in the prosecution of a program embracing the following main objectives:

1. An intensive drive to reach the housewife, boarding house operator, or other persons responsible for the feeding of the worker while on the job, or for the preparation of his lunch box.
2. An approach to industry through both labor and management with regard to the provision of adequate facilities for feeding the worker while on the job.
3. The development and promotion of a program for adding concentrated nutrition supplements to the on-the-job diet of workers in war industry; and be it further

"RESOLVED, that the Office of War Nutrition Services be empowered to call upon the assistance and resources of all departments and units of State government that are now operating in the field of nutrition, or in fields basically related to nutrition, in the development of this program.

"The above resolution was adopted at a meeting of the State War Council, held on Thursday, August 13th, 1942, a quorum being present.

"NEW YORK STATE WAR COUNCIL

BY:

THOMAS L. J. CORCORAN

*Executive Secretary
and Counsel"*

Following the adoption of this resolution, measures were immediately undertaken to obtain a trained and available field staff who could act in an advisory capacity on problems of industrial feeding; to develop the necessary working relationships with the several departments primarily concerned, especially with the State Department of Labor which had already undertaken a rather extensive survey in connection with this problem; and to develop and direct the interest of the local nutrition committees toward this objective. It has been the general policy of the Office that the local nutrition committee, being an organization concerned chiefly with community organization and education, should pay particular attention to the development of methods of reaching and advising the wives and families of the war worker, the boarding housekeeper and the restaurants serving him outside of the war plant grounds. The problem of approach to management and labor, it was felt, had best be handled by the existing official bodies working with these groups, or by direct approach from the War Council where such seemed indicated.

Experience in the latter regard suggests that the industries approached because complaints are brought to the attention of this office are usually less receptive to advice or technical suggestions than are the industries which solicit, because of locally aroused or spontaneous interest, the assistance of this office. Another most productive channel is provided through direct approach to the large industrial food caterers whose operations are extensive throughout the State and who, for the most part, seem exceptionally interested in doing a good nutrition job.

It has been found that the problem of feeding the war worker and improving the nutrition program in industry requires a very comprehensive approach, and that there are relatively few individuals skilled in all aspects of this problem. It requires, for example, first of all, a basic knowledge of nutrition, but it also requires an extensive experience with large scale feeding operation and mass cookery. Individuals with such preparations, of course, are not too difficult to find. But the third element required, namely a large experience and understanding of problems of community

organization in order that there may be a proper integration between the program in the plant and that being carried on by the house-wife or others outside of the plant, and that the right approach may be made to the community and labor groups, requires experience of a quite different sort. In consequence, a good deal of attention has had to be given to the training, through actual experience, of the available staff, and through the advice and constant help of individuals familiar with one or more of these particular aspects of the problem.

The necessary materials, both for the organization of the local nutrition committees in approaching the industrial problem, and leaflets giving particular emphasis to war-time food problems and to the preparation of the lunch box have been prepared and made available to the local nutrition committees. Constant attention is, of course, being given, particularly with the cooperation of the Cornell University College of Home Economics and School of Nutrition, to the preparation of further materials useful in this connection. The Office of War Nutrition Services has also undertaken the regular preparation and supply of news releases and material for radio publicity.

The increasing employment of women, particularly women with families, in industry, is adding new problems and special study is now being given to the preparation and supplying of partially prepared and well-selected meals that may be available at a reasonable cost to the working woman in order that she may take them home and have them easily available for the feeding of herself and her family.

The emphasis on the nutrition of the war worker and the general plan of approach to this problem, outlined thus far, has been in line with that generally recommended by the war industry program of the Nutrition division of the Office of Defense Health and Welfare Services, whose program and recommendations have been developed almost simultaneously with those in New York State as they relate to this activity. Different from that, of any other practical program in operation, has been our belief that, due to the exigencies of war affecting the eating habits of man and available foods on the one hand, and due to the large loss of essential nutrients inherent in mass cooking on the other, it would be impossible, or nearly so, to feed the industrial worker adequately without giving particular attention to the selection and inclusion in his diet of certain natural foods of highly concentrated vitamin and nutrient value. Because of this, extensive studies have been undertaken in cooperation with the School of Nutrition in Cornell, the College of Home Economics, and one of the larger industrial food caterers, of methods for providing such nutrition supplements. For these studies brewers' yeast was selected because of its exceptional food value, availability and relatively small cost. **It may now be stated that highly acceptable methods of incorporating dried brewers' yeast (or primary grown brewers' type yeast) in prepared foods have**

been developed and in fact are in successful use in industrial feeding operations. Careful scientific observations have been made of the food prepared and served in this manner and specimens taken for assay of their vitamin content. It is believed that the principle of nutrition supplementation of this sort is ready for wide acceptance and plans for promotion of this part of the program through war industry are under way.

While, as stated, an attempt has been made to give emphasis to the nutrition of the war worker, it has been recognized, of course, that certain basic programs intended to reach all or other segments of the population must be continued. For example, in cooperation with the Federal Agricultural and Marketing Administration, further interest in the development of the "Penny Milk Program" for school children in population areas of less than 10,000 throughout the State has been stimulated. Similarly, the local nutrition committees have been encouraged to maintain their interest in the school lunch program in general. It is expected that the anticipated withdrawal of W. P. A. assistance, which in some areas has been utilized in developing these programs, may require either the substitution of Federal support through Lanham Act funds, or preferably, local support of this important plan with State aid.

Of great seasonal importance are the Victory garden and home food preservation and canning programs. These acquire particular significance at the present time because of the growing likelihood of rationing and real shortages of a wide variety of foods. Funds have been made available by the War Council to engage the services of fifteen persons qualified to instruct and supervise programs in connection with the home canning plan. Much attention on the part of all State and cooperating agencies is being given to these two activities for the coming year and, in fact, they loom as programs the serious necessity of which is second to none. While responsibility for their conduct is already established in the hands of competent councils and agencies, the Office of War Nutrition Services is taking the steps necessary to assure that there is complete coordination of all resources and facilities under its influence both at the local and State levels in this regard.

The latter part of November and early December, as a result of a request from the Federal government, the Office of War Nutrition Services set into motion the cooperative operation of the local nutrition committees in the training of block leaders in connection with the "share the meat" program. These committees have subsequently carried on supporting demonstrations and classes with the assistance of materials prepared under the auspices of this office.

The problems of the home maker or food operator in supplying adequate and well balanced meals under the limitations of impending food shortages and rationing has become a matter of great concern and has created a second major area of responsibility for the Office of War Nutrition Services and its supporting local nutrition committees.

Accordingly the following steps have been undertaken or are contemplated:

Arrangements have been made for the local rationing centers to be served by educational materials including exhibits, posters and literature, provided by the Office of War Nutrition Services through the local nutrition committees and for representatives of these committees to be present. The purpose of this is twofold: first, to acquaint people with the existence of the local nutrition committees and the ways in which these committees can help them; and second, to disseminate a certain amount of nutrition information at the time of the visit to the rationing center. This, of course, will be supported by a more extensive educational program at the community level.

A series of simple leaflets has been prepared, intended to teach the basic principles rather than the details of balanced nutrition and to provide the home maker or restaurateur with a simple means of selecting alternative foods within the major categories.

Because of the unpredictable nature of shortages and ration values of certain commodities and probable local fluctuations in them, consideration is being given to the expansion of a consumer-retailer information service through the cooperative effort of the State Department of Agriculture and the Office of War Nutrition Services. This service would have as its objective the provision of daily or weekly surveys of the major commodities regionally available and an information service by press and radio with regard to them. This service will be utilized as a means of transmitting certain nutrition information of a timely nature utilizing consumer interest and the market round-up as the vehicle for such content.

Similarly every effort will be made to protect the food retailer who is a most vital link in the food distribution system. Through educational channels the consumer will be advised of his problems and the retailer will be assisted in the distribution of currently little used foods which he finds it difficult to sell at present but which are necessarily going to assume roles of increasing significance.

These plans have been discussed by responsible representatives of all the groups concerned and found fully acceptable as means for aiding in the solution of several serious problems that now seem inevitable.

The rapidly shifting picture of the nation's food supply and our responsibility to our armed forces and to the people of the world, now and in the future, as well as our growing knowledge of our own limitations and needs, create a situation of extreme complexity and unpredictability. It shall be the purpose of the staff of the Office of War Nutrition Services and, we confidently believe, of all those associated with us and upon whom we so completely depend, to lay all other considerations of less moment aside for the purpose of fulfilling our responsibilities in assuring that the nutritional resources of the State are being most effectively utilized toward the maintenance of a healthy and vigorous people during the difficult years of war.

How Self-Sufficient Is New York State?

— 100
PER CENT

ENERGY FOODS



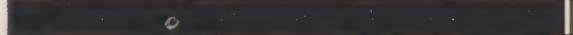
ONE THIRD OF THE REQUIREMENT IS PRODUCED.

PROTEIN



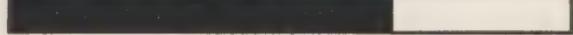
ONE HALF OF THE REQUIREMENT IS PRODUCED.

CALCIUM



PRACTICALLY ALL THE REQUIREMENT IS PRODUCED.

PHOSPHORUS



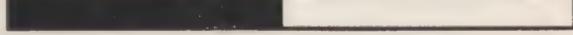
ABOUT TWO THIRDS OF THE REQUIREMENT IS PRODUCED.

VITAMIN A



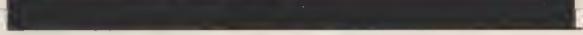
ABOUT HALF OF THE REQUIREMENT IS PRODUCED.

VITAMIN B₁ (THIAMIN)



ABOUT HALF OF THE REQUIREMENT IS PRODUCED.

VITAMIN C



ABOUT 2 PER CENT MORE IS PRODUCED THAN THE REQUIREMENT. NO ALLOWANCE HAS BEEN MADE FOR THAT DESTROYED DURING COOKING.

VITAMIN B₂ (RIBOFLAVIN)



NEARLY ALL THE REQUIREMENT IS PRODUCED.

The above chart shows New York State to be highly deficient in food. The deficiency is greatest in energy food (cereals, etc.), protein (meats, etc.), and vitamins A and B₁. It is but little deficient in calcium and vitamin B and C₂,—principally because of milk production which is half of the agriculture of New York, and of vegetable products like tomatoes and cabbages

NEW YORK STATE NUTRITION COMMITTEE

By G. Dorothy Williams

Former Executive Secretary, New York State Nutrition Committee

FOR many years the State of New York has carried on programs of professional and lay education in the science of nutrition.

These programs have been carried forward by the State Departments of Education, Health, and Social Welfare, and by the College of Home Economics, Cornell University.

In 1939 representatives of these departments and of Cornell University, through regular meetings, pooled their ideas and resources for the purpose of coordination, and also to bring about a wider recognition by the public of the importance of nutrition in building and maintaining health and efficiency.

This group called themselves the State Nutrition Conference Committee. They sponsored three state-wide Nutrition Conferences in 1939, 1940 and 1941, which were held at Cornell University in Ithaca, and which elicited enthusiastic response.

The defense as well as the scientific aspects of nutrition were given great emphasis by the deliberations of the National Nutrition Conference, called by the President, at Washington in 1940.

As a consequence, state and local organization for nutrition education became of importance as a vital factor in the defense program.

Director M. L. Wilson, Chairman of the National Nutrition Advisory Committee, at this time, requested land-grant college authorities to form state nutrition committees for defense, and in carrying out this proposal, Dean Ladd of Cornell University requested the State Nutrition Conference Committee to function as such.

In May 1941 Lieutenant Governor Poletti, as State Defense Coordinator, recognized the State Nutrition Committee as a cooperating agency to the New York State Defense Council. From July 1, 1941 until September 1, 1942 the State Nutrition Committee operated with the assistance of state funds appropriated for defense purpose.

With the formation of the Office of War Nutrition Services in July, 1942, the State Nutrition Committee became an advisory body to that Office. The functions, staff and budget of the Nutrition Committee were absorbed by the Office of War Nutrition Services.

The Local Nutrition Committees

Since late in 1940 local nutrition committees have been organized in the upstate counties and larger cities, and in Greater New York.

The membership of the local committees comprises professional personnel and representatives of any and all agencies engaged or interested in nutrition activities.

The following groups or organizations in particular have been suggested as cooperating bodies:

"Local Volunteer Office, Tuberculosis and Public Health Committees, 4-H Club, Farm Security Administration, County Agricultural and Home Demonstration Agents, Grange, Parent-Teacher Associations, organized medical and dental societies, local representative of State Dietetics Association (500 members), local representative of Home Economics Association (1200 or more members), institutional dietitians, home economics teachers in schools, district State Health officer or county or city health officer or other representatives, nursing associations, welfare home economists or other home economists, representative of board of supervisors, school authorities (especially re school lunch program), Red Cross, librarians, YMCA, YWCA, YMHA, YWHA, church and fraternal groups, Scouts, garden clubs, American Legion and auxiliary, service clubs (men and women), out-of-service trained home economists and other food trained people, utility demonstrators, land use planning committees, representative of Council of Social Agencies, county children's agents, home-making supervisors (in education departments), cafeteria and restaurant managers."

The State Nutrition Committee assisted in the formation of these committees and has sponsored them since their organization. While no set program was superimposed on them, local groups were asked to report their work to the state body, and to cooperate in carrying out defense projects as indicated by the State or Federal defense authorities. Monthly news letters were issued and posters, leaflets and other illustrative materials were sent to the local groups from time to time from the State Committee.

An increasing number of these local committees have been recognized by local war councils and have been integrated into the civilian war services divisions of these councils.

Both State and local committees have a valuable purpose in addition to their war-time functions. The counseling together of representatives of agencies doing a similar piece of work and the integration of programs which result are worthwhile.

Publicity

Any program must be accompanied by a well-planned publicity campaign in order to be successful. Each local nutrition committee has a sub-committee on publicity. Some counties have a weekly

column through which they keep the public informed about matters of local interest and news about food.

In cooperation with the Conference of Women's Educational Organizations a state-wide observance of "Nutrition Fortnight" proclaimed by Governor Lehman was carried out by the state and local units in the fall of 1941. Every channel for publicity was utilized, radio, press, meetings, interviews and conferences.

National Dairy Month was celebrated at the request of the State Committee on Milk and Milk Products. Posters, booklets, radio and press material was furnished the county committees.

Radio

Radio has become an important means of communication with the general public. All local nutrition committees who have access to a radio station have made use of this medium and several broadcast a weekly program.

The State Nutrition Committee through the Office of War Information and with the cooperation of the College of Home Economics have sent a weekly radio script and several "spot announcements" to nutrition committees and radio stations. This service is being continued by the Office of War Nutrition Services.

Exhibits

In a number of counties outstanding and unusual exhibits have been developed in connection with food shows, winter fairs and similar enterprises and in banks and libraries.

City and county-wide exhibits, such as the "Food for Freedom Parade" put out by the Rochester and Monroe County Nutrition Committee in November, 1941 have been common throughout the state. Among others, Erie County and Buffalo, St. Lawrence County, Schenectady, Oneida City, Elmira and Niagara Falls have been outstanding.

School Lunch Programs

In cooperation with the Federal authorities concerned with surplus foods the school lunch program has been inaugurated and carried forward by these local units. An impressive increase in the number of schools instituting school lunch programs has been reported as the result of this emphasis.

During the summers of 1941-42 similar promotional campaigns were conducted to stimulate lunches at children's playgrounds.

Nutrition Courses

Through the rapid state-wide expansion of volunteer registration under the State Office of Civilian Mobilization thousands of women have been able to attend courses in family nutrition; others have taken qualifying courses as nutrition aides. In addition, professional leaders and several universities have established teacher training courses for professionally trained persons wishing to bring their knowledge up-to-date. In this program Cornell's extension

service, the Red Cross, and public school personnel have been especially active. The College of Home Economics also prepared a short course in nutrition for the State Nutrition Committee's use and is preparing a series of lessons to be used by local nutrition committees in their program to assist housewives to feed their families adequately during wartime.

To date 2889 classes have been reported and more than 76,000 women have been under instruction. These figures are exclusive of the activities of the Extension Service of Cornell University, the State Education Department or other adult education program.

Information Centers

The establishment of stations where citizens may receive counselling is one of the desirable developments of a local nutrition program. Four cities have already opened such centers and others are in prospect.

Nutrition Clinics

One county committee with the approval and cooperation of the organized medical and dental groups has opened a center with physicians and nutritionists in attendance to which school children are referred for food counselling.

This is a promising venture and one that is being watched so that if successful it may be applied elsewhere.

Nutrition in Industry

With the rapid expansion of war industries and the acute need for increased production, the health and efficiency of the workers becomes of paramount importance. Nutrition Committees have been interested in this problem from the beginning and have made an effort to reach the wives of industrial workers and the workers themselves with information about adequate meals.

During the past six months increased emphasis has been placed on this problem. Elmira and Chemung Counties, Niagara Falls and Rome, among others have staged campaigns to reach the industrial group with information about improved lunches. The "Westinghouse" and "Servel" plans have been used in six or more communities, posters have been placed in plants by other committees and literature distributed among the workmen in still others. This activity is rapidly accelerating.

Conclusion

Good nutrition in any people is an important asset that is reflected in health, morale and productivity, important at any time, but especially so in war.

Wartime food restrictions, rationing and use of substitutions should be accompanied by a wide-spread educational campaign to reach all the people with the information they need in order to be well fed.

NUTRITION SERVICES AT CORNELL

THE field of nutrition deals with the maintenance and improvement of health through dietary means. It deals with specific nutrients such as carbohydrates, fats, proteins, minerals and vitamins which are essential for the normal functioning of the body. While nutrition has medical aspects involving both health and disease, its scope is much broader than this, for it is a matter of daily concern for all and not merely a problem for the sick. Body needs for nutrients must be translated into available foods. Here, nutrition deals with the processing and preserving of foods both in the home and in the factory, with cooking, with food sanitation, with food economy, and even with the production of foods, with particular reference to their nutritive value. These manifold aspects of the field are in turn dependent upon the knowledge and techniques of the basic sciences of chemistry and physics, of biology and physiology, and of pathology and bacteriology. Any true appraisal of the nutrition services of any institution must take into account the extent to which all of the aspects of the field are being covered. Such is the basis upon which an analysis of the nutrition services at Cornell is here presented.

Nutrition Service Units at Cornell

To meet the many and varied needs of the field, the nutrition services at Cornell are provided by several different administrative divisions. The College of Home Economics is the major nutrition teaching unit, both for the training of students for home-making and for many professional services, and also for the extension of nutrition knowledge to the homes throughout the state. This College is also actively engaged in research in the various aspects of the field. Certain units of the College of Agriculture supplement the nutrition teaching activities of the College of Home Economics and are also carrying on research fundamental to the improvement of the nutrition program and to the production of a more nutritious food supply. The Geneva Experiment Station is engaged in studies of food processing and preservation and of the growing of food crops most suitable for these purposes. The School of Chemical Engineering deals with the engineering aspects of food processing, preservation and storage. The University Clinic is cooperating in important work on the relation of diet to health and disease. Various units of the Colleges of Arts and Sciences and of Veterinary Medicine are supplying the training in the basic

sciences which is essential for a thorough understanding of nutrition and for the application of its principles in teaching, research and extension. The U. S. Plant, Soil and Nutrition Laboratory recently established at Cornell provides facilities for advanced training and research in the nutritive value of food crops and their products, not available elsewhere in the world.

Many of these activities in the various units are correlated in the School of Nutrition which is specifically responsible for certain programs of nutrition teaching and research in the University as a whole. All of these divisions of the University combine to furnish the diverse but integrated activities which are necessary to service the manifold aspects of the field of nutrition. The services can best be outlined under the conventional headings of Resident Teaching, Extension Teaching and Research.

Resident Teaching Services

College of Home Economics

The Department of Foods and Nutrition, one of the six departments of the college, contributes to the preparation of its undergraduate and graduate students for (1) homemaking; (2) a variety of home economics vocations directly related to the subject matter field of food and nutrition, such as hospital dietetics, food administration in commercial and educational institutions, public health and Red Cross nutrition work, nutrition work in extension; college teaching, and foods and nutrition research; and (3) a variety of home economics vocations less completely built on the subject matter of foods and nutrition, but still making a definite contribution to the spread of foods and nutrition teaching. These vocations are: teaching in secondary schools, extension teaching, and social welfare.

Courses offered by the Department of Foods and Nutrition deal with food preparation, food preservation, food buying and storage, normal nutrition of adults and children, and diet in disease.

Especially contributing to certain vocations directly related to foods and nutrition as described in (2) is the Department of Institution Management. This department provides courses that deal with large quantity food purchasing and preparation, organization and administration of institution food services, accounting, catering, and the school lunch.

The student body of the college consists in 1943 of 520 undergraduates and about 50 graduates. During their residence in the college all undergraduates and many graduates register in from two to six courses in the Department of Foods and Nutrition. Students preparing for institution food administration register also in a series of courses preparing for institutional types of work.

Of a total of 2,029 living alumnae of the College of Home Economics, 872 are known to be gainfully employed. Of these,

504, are working in home economics vocations described in groups (2) and (3) above. These 504 are distributed as follows:

Group 2.....	147 (29%)
Hospital dietetics	69
Food administration in commercial or educational institutions.....	53
Public health	5
Red Cross	4
Extension nutrition work.....	2
College teaching	10
Foods and nutrition research in college...	4
Group 3.....	357 (71%)
Teaching in secondary schools.....	270
Extension teaching	72
Social welfare	15

Aside from courses designed for the training of the students registered in the College of Home Economics, a course in Human Nutrition has been offered for the past three years for students registered in any college on the campus. Also a limited number of students in other colleges at Cornell register each term in some of the elementary courses in foods and nutrition offered in the College of Home Economics.

The College in cooperation with the School of Nutrition further provides the services of nutrition consultation in the University Clinic and a special diet feeding program for students of the University whom the medical staff refers for such a purpose. A further program is proposed for research in certain problems concerned with the relation of diet to health and disease.

College of Agriculture

Basic training for the field of nutrition, particularly in the biochemical and physiological aspects involved, is given in the College of Agriculture. This training also deals with methods of assessing nutritional status with special reference to troubles resulting from vitamin and mineral deficiencies, and with methods of analyzing foods for their various dietary constituents.

The major teaching activities of the College in the field of nutrition are concerned with the production, processing, and marketing practices required to provide a food supply which will most effectively meet the nutritional needs of our population. Thus, in its animal and crop departments, courses are presented dealing with the production of meat, eggs, milk and dairy products, and of fruits, vegetables and cereals, with special reference to their most effective utilization in human nutrition. The principles and practices involved in marketing these various products are taught. Other courses deal with the processing and storage of these foods, with the bacteriology of food products, and with problems of food sanitation. These various courses in the College of Agriculture,

dealing primarily with the basic food supply, furnish an essential counterpart to those teaching activities in the College of Home Economics which deal with the selection, preservation and preparation of food in the home.

Recently, a course has been inaugurated under the title "War Emergency Food Problems", which deals with the application of the modern science of nutrition to the production and distribution of foods with particular reference to problems created by current shortages, and to post-war problems.

The resident teaching services of the College of Agriculture serve to train future farmers in the knowledge and techniques which will enable them to produce plant and animal products of superior value both for nutritional needs and market demands. Many of the graduates of the College enter the food industry where they utilize their training in nutrition in the processing and marketing of foods, in essential chemical and bacteriological control activities, and in the development of new and nutritionally superior food products. The training received also qualifies men for service in federal, state and municipal units charged with the inspection and control of the sanitary and nutritional quality of foods and feeds.

The graduate teaching in the College trains men for teaching and research in many aspects of nutrition. The teaching services here offered attract an unusually large number of students from foreign countries as well as from various parts of the United States. The excellence of the training thus provided has been recognized by the War Department during the past year in that the Department has requested the deferment of graduate students majoring in nutrition until they have completed their graduate work, with the understanding that they will then obtain commissions in the Food and Nutritional Division of the Medical Corps.

Other University Divisions

The College of Arts and Sciences provides courses in chemistry, physics, mathematics, biology, zoology, and related sciences, which constitute the essential fundamental basis for a thorough training in nutrition. It also provides instruction in the social sciences, a knowledge of which is essential for many workers in certain nutrition fields. Similarly, the College of Veterinary Medicine furnishes the basic training required in physiology and pathology.

The School of Nutrition was recently organized to provide two or more years of integrated nutrition training for those who have already completed three years of appropriate basic college work. Different schedules of courses are offered in accordance with the requirements of the specific field of nutrition which the student may wish to emphasize in his training. The School thus integrates many of the nutrition teaching activities of the different colleges of the University as well as providing some expansion of the total facilities available. For example, in cooperation with the School of Chemical Engineering, instruction is furnished in the biochemistry of foods and in food processing for chemical engineers who plan to enter the food industry.

Extension Teaching Service

College of Home Economics

The State Extension Service is the government agency which carries to the people in their home communities the practical results and application of research in agriculture and home economics. The teaching of foods and nutrition is carried on in the counties by the home demonstration agents, the 4-H Club home economics agents, specialists from the Department of Foods and Nutrition and Department of Institution Management and by local leaders from the counties. These services are financed by federal, state, county, and local funds.

Of the more than 60,000 women enrolled in 1640 Home Bureau units in 57 counties and 3 cities of the State, the majority are carrying a nutrition program directed from the college. Of the more than 35,000 boys and girls in 4-H Clubs in 51 counties, nearly 9,000 were enrolled last year in projects concerned with food preparation and preservation. The purposes of all these projects is to help homemakers and young people to contribute to victory through learning how to plan and prepare nutritive meals; to produce and conserve food for family use and to release food for the armed forces and others; and to use substitutes for foods that are rationed or that are becoming scarce. Printed bulletins are extensively used in all of these projects. Additional printing funds were assigned to the College from the New York State War Council.

The results of the adult program in 1942 are shown as follows:

Number of families reporting:

Improved meals	64,742
Improved food supply by home production.....	16,277
Increased amount of foods preserved.....	44,875
Increased amount of foods frozen.....	3,368
Increased amount of foods dried.....	13,358
Increased amount of foods stored.....	14,683
Number of schools assisted in establishing hot lunches.....	414
Number of health or nutrition clinics organized through efforts of extension workers.....	51

Some of the tangible results of the 4-H Club program are shown by the following figures:

4-H Club members conserved foods as follows:

quarts canned	307,693
pounds stored	2,798,471
pounds dried	8,957
pounds frozen	11,728

Throughout the year, the foods and nutrition extension services, both adult and 4-H Club, cooperated with the New York State War Council, Red Cross, State and County Nutrition Committees, Social Welfare Agencies, State and County Public Health Departments.

Farm Security Administration, and many private organizations to improve the health of the people of New York State.

Through additional funds assigned in 1942 to the College by the New York State War Council it was possible during the year to include industrial workers in the nutrition program; to carry on an enlarged program in food preservation for homemakers over the state. Also with the use of these funds, the Department of Institution Management employed a full-time extension specialist to meet the tremendous number of requests for help with emergency group-feeding projects. Training schools to prepare teachers to train volunteers in mass-feeding were held at the Home Economics College; 130 dietitians, homemakers with home economics training, and home demonstration agents attended. A canteen course sponsored by the Red Cross but taught by the college was given to train a group of women from Ithaca and nearby communities for volunteer service in group feeding activities related to the war effort or disasters. Other schools were held in Utica and Poughkeepsie. Quantity-cookery lecture-demonstrations were held in Waterloo, Penn Yan, Ovid, and Odessa. Demonstrations of the use of the Cornell Mobile Kitchen were carried on in Ontario, Utica, and Cortland Counties, and at the Seneca Ordnance Depot. Calls were made in 20 counties for consultations concerning the training of workers for group-feeding.

The specialist assisted the State Committee on Mass-feeding in setting up a mass-feeding training plan for volunteer workers. She also worked with State and federal war nutrition services, the Red Cross, the New York Restaurant Association, the New York State Dietetic Association, the Red Cross Disaster Institute, and with many individuals.

College of Agriculture

Extension teaching in the production and marketing of food crops and animal products used for food is carried on by extension specialists in various departments of the College, and by County Agricultural and 4-H Club Agents whose activities are supervised by the College. These services are similar in scope to those in home-making previously outlined for the College of Home Economics. An activity of special importance during the war emergency has been to help farm families determine what foods to raise, preserve and store, and to provide directions as to how to raise, preserve and store these foods so as to obtain as much as possible of the family food supply from the farm and garden. Suburban and village families are included in this program.

Nutrition specialists at the College prepare digests of information and exhibit material for the use of State and local nutrition committees, and other agencies which disseminate nutrition knowledge through meetings, publications, and other channels. A large amount of current nutrition information is also distributed throughout the State in extension publications issued by the College. In many ways the most effective extension teaching service is accomplished through correspondence in answering the thousands of letters dealing with

many aspects of food, nutrition and health, which are received annually from consumers and also from those engaged in the production, processing and marketing of foods.

Each year a three-day nutrition conference is held at the College for representatives of the food and feed industries at which the latest findings of research and their practical applications are discussed.

The **Geneva Experiment Station** carries out certain extension service activities assigned to it by the College. For example, it advises regarding the selection of desirable crops to grow, and their preparation for canning, quick freezing and dehydration. Much of this service is rendered through the commercial processor who in turn passes on the information to growers. Assistance is also given direct to the housewife in the various procedures involved in home quick freezing. The Station disseminates through correspondence much information on foods to consumers throughout the State, and to commercial food processors who both handle New York State crops and produce foods for State markets.

Research Services

Research is fundamental to all other activities in the field of nutrition, not only to discover new facts and principles which will provide the basis for better nutrition and health, but also to solve current problems arising from a changing food supply and changing human needs. Nutrition research calls for the knowledge and techniques of many basic and applied sciences, and for extensive and diversely equipped laboratories, representing requirements which are furnished to an exceptional degree by the combined facilities of the various divisions of Cornell University previously mentioned. The following brief statement is designed merely to illustrate the scope and accomplishments of Cornell's research services.

College of Home Economics

Studies have been carried out with both adults and children on the metabolism of vitamin C and on its need by the body under different conditions. These studies have resulted in exact and conclusive data as to the amounts of the vitamin required for health and efficiency, and thus have provided the facts needed for the selection of diets adequate in this factor.

In cooperation with workers in the College of Agriculture and the U. S. Nutrition Laboratory, investigations are in progress on the quality of New York State vegetables. Important results have been obtained on the nutritive value and cooking quality of potatoes, for example, providing information which will guide the farmer in producing potatoes which will best meet consumer needs, as well as revealing the part potatoes can play in improving the diet of many people.

Investigations are being carried out in the College, with the cooperation of the Geneva Experiment Station, on the losses of vitamins that occur in home freezing and also in the commercial dehydra-

tion of vegetables. Studies are also in progress on the vitamin losses during the cooking of certain fresh, frozen, and dehydrated vegetables, with particular reference to quantity cooking procedures. An important objective of these studies is to develop methods which will result in minimum losses. The data thus far obtained have proved of outstanding value to government authorities who are promoting the production of dehydrated foods in the war emergency, and also to the army, which is particularly concerned with the losses in quantity cooking such as occur in camps. Certain phases of these investigations are being supported by the War Department through the National Research Council. They have already provided information which has been put to practical use in army cooking.

Investigations of the calcium and phosphorus nutrition of growing children, of the relative economy of various foods in an adequate diet in New York State, and of consumer needs and preferences for foods and food preserving equipment, are other research projects in progress in the College.

College of Agriculture

For many years, investigations have been in progress on the relation of the nature of the diet to the retardation of ageing changes in the body, to the onset of the diseases of old age, and to the length of productive life. The life span of experimental animals has been greatly extended by dietary means in these studies, and important facts as to dietary composition and eating habits have been learned which should apply to man. The data have also developed suggestions for extending the productive life of farm animals.

The College workers have made several pioneer investigations which have contributed to the modern discoveries with respect to vitamins. Studies of the needs of poultry for various water-soluble vitamins have developed information, not only of practical value for the production of eggs and meat, but also of fundamental importance for the better nutrition of other species including man. In the course of these various investigations, new and better methods of assaying foods for vitamins have been devised, and important data on the vitamin content of human and animal feeds have been obtained. Much of the modern nutrition knowledge has come from basic studies with white rats and other laboratory animals. Investigations in the College with these species are constantly contributing new information on nutritional requirements for protein, minerals, and vitamins, which is applicable to man. They are also furnishing data on the nutritive values of human foods. The discovery of the need for manganese in poultry rations to prevent the widespread trouble commonly referred to as "slipped tendon" has provided information helpful for improving bone growth and strength in other species.

In the research program of the College much attention is being given to means of providing the consumer with more nutritious and wholesome, protective foods. Investigations in progress with

dairy cows are providing useful information, not only for more efficient milk production, but also for the supplying of a product of higher nutritive value. Special studies have dealt with deaeration and other processes as means of avoiding off-flavor in milk and of lessening vitamin losses in processing and storage. Various experiments dealing with the production of milk, eggs, fruits and vegetables are concerned with their nutritional quality as well as with yield of these essential foods. Methods of storage, such as the use of a modified atmosphere, which may make fruits and vegetables available for longer periods and better preserve their nutritive values are under investigation.

Studies of market demands for milk, fruits and vegetables, and of methods of marketing these products are constantly in progress to develop information of value to the producer, and also to gain knowledge which should help in providing a cheaper and better food supply for the consumer.

Fundamental studies of the feeding of fish and game, and even of the nutrition of insects in the interests of either control or propagation, have important bearings on the human food supply.

The Geneva Experiment Station

Nutrition research at the Geneva Experiment Station has centered largely around food processing. It has conducted pioneer studies on the quick-freezing of foods, particularly fruits and vegetables. This has involved the selection and growing of the most suitable varieties both as regards nutritional qualities and adaptability for freezing, their preparation and freezing to avoid loss of nutrients in so far as possible, and also packaging, storage and other problems concerned. Finally the products are tested for palatability, cooking quality and nutrition in studies carried out cooperatively with the College of Home Economics. Attention is also being given to the quick-freezing of meats and poultry. The results obtained are finding wide applications in homes which have quick-freezing units, in commercial plants, among those who own freezer-lockers and also among all users of frozen foods.

Recently, investigations have been inaugurated on the dehydration of vegetables, a development which has become of special importance in the war emergency. Different varieties of many different vegetables harvested at different stages of maturity, are being studied to learn which will produce the best results as regards the retention of the natural flavor and nutritious qualities of the product. Special attention is being given to packaging problems to devise methods, without the use of tin or glass, to keep out air and moisture, conserve vitamins in so far as possible and avoid contamination from insects, molds and bacteria. These studies have a direct relation to the war effort. Fruit and vegetable juices which contain essential minerals and vitamins have been dried to solid, candy-like concentrates to serve as emergency and supplemental rations for the armed forces.

All of these processing studies require the close cooperation of chemists, bacteriologists, entomologists and home economists as well

as a variety of experts who produce the crops in the first place. Fundamental investigations by the biochemist of the pectin and pectin enzymes in fruits have been required to solve some of the problems which have arisen.

Other studies at the Station related to foods and nutrition are those dealing with the quality of vegetables for canning, maple products, fruits juices, and also with non-poisonous insecticides.

School of Nutrition

Investigations dealing with the relations of nutrition to health and disease, involving the cooperation of the University Clinic and the College of Home Economics, were recently inaugurated under the administration of the School. These studies are already proving of real service to student health as well as providing important basic information.

The School is directing a comprehensive investigation of the processing and distribution of protective foods for the improvement of nutrition and health. This program includes studies of consumer needs and preferences being conducted in the College of Home Economics, engineering studies of processing equipment in the School of Chemical Engineering, and biochemical and nutritional studies of processed foods in the College of Agriculture and elsewhere. Certain aspects of this investigation are being integrated with related studies in progress at the Geneva Experimental Station.

Studies are under way to establish mineral and vitamin standards which should be reasonably met, assuming proper methods of processing and handling of foods which are assumed to be rich sources of those nutrients and which are of special value in the diet accordingly.

The School has been serving as a source of technical information on nutrition for the State War Council. It has made studies and reports on various aspects of food supply and food needs in the State. Data were assembled on the nutrients supplied by foods produced in the State in relation to the needs of its population. A special investigation was made of available supplies of fats and glycerin to provide data for guiding the policy of the State campaign on fat salvage. The status of the enriched flour and bread program in the State, and the development of methods of incorporating brewers' yeast into every-day foods as a source of vitamins, are among the other problems which have received attention.

Financial Support

Nutrition activities at Cornell are supported by Federal as well as State funds, and also by some endowed funds of the University. In addition, Cornell's facilities and accomplishments in nutrition have attracted many special grants from foundations, corporations, and private sources. For example, the studies of nutrition and ageing referred to in this report have been supported largely by grants from the Rockefeller Foundation, totalling over \$100,000.

NEW YORK STATE SOCIAL WELFARE DEPARTMENT

THE Social Welfare Department does not have a specific nutrition program but there are certain phases of the work which come within the field of nutrition.

The technical staff in the central office consists of one Home Economist and one Nutritionist. They are responsible for the following activities:

1. Development on the state level of sound policies, methods and procedures for budgeting the needs and income or resources of recipients of public assistance. This includes the establishment of standards for the various items of need including food. It requires constant study of the costs of goods and services and of consumer patterns.
2. Consultant service to local public welfare agencies assisting them with their responsibility for the establishment of local budget policies and allowance schedules.
A consultant service is also given to them in their effort to assist individuals or families to maintain themselves within the limits of their financial resources and to assist them in their return to self-support.
3. Consultant service to local public welfare agencies on special diets. The development of guidance material to assist the case workers in making any adjustment in the regular food allowance to meet the needs of patients for whom the physician has recommended a special diet.
4. Consultant service to institutions, public and private, which come under the direction or supervision of the Department. This includes hospitals, homes for the aged, public homes, and child caring institutions. In the field of nutrition this service includes interpretation of the nutritive requirements of the types of persons served by the institution. Advice is given on management problems including food selection, purchases, preparation and service. In some instances it includes advice as to the synchronizing of their food production and food purchase plans.
5. Consultant service to the child care programs of the Department and to local child welfare agencies who are concerned with the foster care of children.
6. Participation in other state programs, especially those of State Departments such as Health, Education and Labor and with other educational agencies which deal with the problems of the low income group.

Food Allowance Standards

An important function within the field of nutrition is to establish the standard by which the food needs of individuals and families applying for or receiving assistance are determined. The kind and quantity of food needed by individuals of various ages, physical conditions and activities must be translated into a food allowance schedule based on the current cost of food items in local communities. This is periodically reviewed in order to adjust allowance schedules to major fluctuations in cost. Establishing and maintaining a standard which protects health is absolutely essential both for the state and the individual.

The social service staff of the local welfare agency, or a trained volunteer, makes a survey of food prices in the major shopping centers of their area using State Department forms and instructions. If the agency does not have a Home Economist on its staff, they submit the survey to the State Department for analysis. The prevailing prices are determined and the cost of food for various age groups determined. The local welfare agency compares this cost estimate with the local food allowance schedule and determines their action as to revision. While the State does not establish either a state-wide standard or a compulsory local standard, its assistance to the local agency serves to insure adequate nutrition standards while recognizing variations in the cost of food in different localities.

Cooperative Activities

Both the Home Economist and the Nutritionist have taken an active part for several years in the work of the State Nutrition Committee and are now actively cooperating in the program of the Office of War Nutrition Services of the State War Council. The Nutritionist has been assigned for practically full time service in the nutrition program for workers in war industries of the Office of War Nutrition Services.

Duplication of effort has been avoided by the active participation of both consultants in all cooperative programs within their professional field initiated by the federal government, other state departments, colleges, or other agencies.

NEW YORK STATE EDUCATION DEPARTMENT

1. Nutritional Activities

a. Pupils in School

Classroom Teaching

Health—Simple instruction in nutrition as *part* of the classroom instruction in health.

Home Economics—Concentrated instruction in foods and nutrition and preparation of family meals.

School Lunch—Many schools in the State provide food for children who remain at school during the noon hour.

b. Out-of-school youth and adults

Class or group teaching in foods and nutrition and preparation of family means.

Information centers for assisting homemakers with nutrition and family meal problems.

Group demonstrations given to the public to help with one or two specific nutrition or food problems.

Visiting homes to give further assistance with nutrition problems or to help those who have not been able to go where help was offered.

Other means such as printed and mimeographed material, newspaper articles and radio talks.

2. Organization—The organization through which the program is carried out is as follows:

State Education Department

State Supervisors of Health Education and Home Economics

Public Schools

School administrators

Local supervisors

 health teaching

 home economics

Classroom teachers

Local Lunchroom managers

Cooperation with other State and Federal agencies

State

Nutrition committee. Three members from the State Education Department are members of this committee.

Works Progress Administration. Regular meetings once a month have been held to discuss matters relative to the use of W.P.A. labor for school lunch programs.

Agricultural Marketing Administration. Conferences as necessary on matters relative to the use of surplus foods in school lunches.

Federal

Nutrition Committee. The State committee coordinates its program with the Federal committee.

Office of Education. The work of the Bureau of Home Economics Education and the school lunch program are coordinated with the National programs of Home Economics Education and the school lunch.

3. Program

a. Pupils in School

Classroom teaching

Health—Elementary grades (grades 1 through 6).

Simple instruction is given in nutrition in each grade by the regular classroom teacher, as *part* of the teaching of health.

Secondary school—instruction is given in nutrition by health or hygiene teachers as *part* of the health course in the junior and senior high school.

Home Economics

Secondary school

Junior high school—Courses in home economics are offered in all three grades (7th, 8th and 9th).

From $\frac{1}{4}$ to $\frac{1}{2}$ of each course is practical work in foods selection, nutrition and preparation of food for the family meal.

Senior high school—Four courses in foods, nutrition and the preparation of the family meal. Two are elementary based on the work in the junior high school. Two are advanced and deal with more complex problems of nutrition and feeding the family, as well as planning and preparation of meals for large groups (as the school lunch.)

School lunch—Noon lunch and midsession lunch.

Many school programs include the provision of hot food for children who remain at school during the noon hour. In some schools a complete lunch is served for those who desire it. Midsession lunches to pupils for whom it is desirable is a practice common to many schools in the State.

This project is used to improve the nutritional status of all pupils and as a practical means for teaching food and eating habits.

b. Out of School youth and adults

The public school program of home economics education includes various kinds of help for adults in food selection, nutrition and the preparation of adequate meals for the family, through organized classes or group meetings, information centers, public demonstrations, teaching in homes, mimeographed material, radio talks, newspaper articles, etc.

4. Personnel

State Education Department
 Division of Health and Physical Education
 Two health teaching supervisors
 Bureau of Home Economics Education
 One chief and five supervisors
 Public Schools
 Local supervisors
 Health teaching—24
 Home economics—18
 Teachers
 Health and Hygiene
 Home economics—day school and adults
 School lunch managers

5. Costs

No accurate statement can be made concerning costs since nutrition is *not all* of either the health teaching or home economics education programs in the public schools.

6. Accomplishments

a. Pupils in School

Health Teaching

Elementary grades—All children receive some health education which includes some nutrition, but not in a special course

Secondary school—Junior high school pupils receive some health education which includes some nutrition. It may be incorporated in a course already being taught or be a special course in health. Senior high school pupils take an approved one year course in health education which includes some nutrition.

Home Economics

Junior high school pupils receiving special work in foods, nutrition and preparing food for the family meal, as part of the home economics course offered at each grade level, at least 10 weeks, a lesson a day—
 7th grade—usually required. 35,507 pupils (girls)
 8th grade—at least 10 weeks, a lesson a day, usually required 28,574 girls

9th year—at least 10 weeks, a lesson a day—elective 7,555 girls

Senior high school

Elementary foods and nutrition in preparation of family meals—one lesson a day for a year
15,261 pupils

(the greater majority are girls.)

Advanced foods and nutrition and family meal preparation, one lesson a day for a year 1,608 pupils
(the greater majority are girls.)

Approximately 3500 boys are taking home economics classwork, the majority being registered in foods and nutrition courses.

School Lunch

The following percentages of schools in the State provided hot food for noon lunches of pupils:

83% of the cities for noon lunch of pupils

83% of the villages

94% of the central rural schools

69% of union free schools with academic departments

In a large percentage of these schools a complete lunch is served.

Adult Education

277 cities and towns offered classes in homemaking during 1941-42 with 500 teachers enrolling 19,355 adults. The major part of this work was in foods, nutrition and the family meal.

Nutrition Education in the Colleges and Universities

This report would not be complete without a statement of the nutrition work being done in the colleges and universities of the State where specialists in nutrition are trained.

In colleges and universities where there is a home economics department there is a foods and nutrition sequence which gives special training in nutrition for:

- a. teachers of home economics, part of whose work is foods and nutrition (eight colleges and universities are approved for teacher education in home economics.)
- b. home demonstration agents and 4-H club leaders—part of whose work is foods and nutrition
- c. hospital dietitians
- d. nutritionists in the public schools (health and hygiene teachers), in social welfare, in public health programs, in commercial firms and in other situations.

This foods and nutrition curriculum includes pre-requisite or parallel scientific training in Chemistry (inorganic, organic, food, biophysics, bacteriology, physiology to the amount of 14 to 24 or more semester hours of college credit.

NEW YORK STATE DEPARTMENT OF HEALTH

The New York State Department of Health first employed a nutritionist in 1922, in connection with the work of the Division of Maternity, Infancy and Child Hygiene, for the stated purpose of instructing public health nurses, and for promoting an educational program.

Because of the constantly expanding scientific knowledge in the field of nutrition, and because, too, of the rapid turnover of nurses, state and local, the first of these objectives has been a continuing process.

In developing an educational program for the public, varying methods and channels have been utilized. Single lectures followed by planned class-work; the issuance and distribution of pertinent printed material; preparation of press articles and scripts for radio use, and the conduct of demonstrations dealing with purchasing, budgeting and food selection and preparation were, and still are, the usual methods employed.

In the period 1922-1936, hundreds of communities, large and small, urban and rural, in every county of the state were visited under various local auspices, such as women's clubs, service clubs, civic organizations, Parent-Teacher Associations, nursing and social-worker groups, church societies of all denominations, Red Cross Chapters, Y.W.C.A.'s and Y.M.C.A.'s, agricultural associations, etc. An average of 5,000 individuals were so reached each year by means of direct teaching and many times this number indirectly through the classes subsequently taught, in turn, by the professional members taking the original courses.

Advisory assistance to individuals, organizations and institutions has always been and continues to be an important function of the nutrition service. Fifteen hundred to 2,000 inquiries by correspondence alone are received every year. Some of these necessitate considerable time and research in order that up-to-date, scientifically accurate replies may be composed. They are of interest in the health program, first, because they give evidence of penetration of nutrition knowledge, and secondly, because their extremely varied character gives great opportunity to assist people with personal health problems and point to areas which must be considered in the educational program.

Advisory Aspects

Included in the advisory aspects of the nutrition service is the assistance given to individuals and groups attempting to develop their own or community programs. This may be the preparation

of lesson plans particularly suited to the needs of certain groups or to certain local problems and situations; the assembling of reference and exhibit materials and bibliographies, furnishing loan teaching material, etc.

Department and local clinics have been visited frequently for the purpose of advising those in charge in dealing with family nutrition problems, where the adjustment of income to nutritional needs is often difficult.

State and local institutions have been assisted from time to time in working out suitable dietaries within the limits of food allowances.

The issuance and distribution of timely, pertinent literature provides an acceptable channel for education of the public in nutrition principles. In accordance with the state economy programs, items of temporary usefulness have been issued in mimeographed form. Sixty-four different items have been so issued and distributed—some 13,000 pieces. Eighteen pamphlets, or charts, have been printed, revised, reprinted, and distributed. More than two million copies have been printed between 1922 and 1935. Of these, the vitamin chart is probably best known. This was first issued in 1927, has been revised and reprinted every year, and between 1927 and 1935, 94,000 have been distributed. It has been reprinted and distributed by other states and by numerous ethical concerns.

When Social Security funds for maternal and child health services became available in 1936, two nutritionists were added to the staff, and between 1936 and 1941 about as many persons were reached by direct teaching as were in the fifteen years previously. An indication of the interest in, and demand for nutrition education, and the possibilities resulting from good planning and local organization is exemplified by the program developed under the auspices of the Yonkers Tuberculosis Association in 1941 when 755 class sessions to seventy-six different groups of thirteen different types were conducted by the staff nutritionists in thirteen communities of Westchester county with a total attendance of 3,000. The record for 1942 was 219 groups with a total attendance of 10,000 in seventy-four communities of forty counties. This also involved in the home office the preparation of a four-unit course for classes studying nutrition in defense, reference outlines, bibliographies, testing and issuing low-cost recipes, assembling film lists, revision of three charts, assembling exhibit materials, preparing items for the press and for radio use, and the printing of two leaflets.

In the meantime, in this period 1936-1941, the results and the health implications of recent research in nutrition became so impressive that a movement was started in cooperation with representatives of the State Departments of Education, Social Welfare, and the College of Home Economics of Cornell University to bring these facts to public attention by means of a series of state conferences. Three of these were held at Cornell University, Ithaca, two of which preceded the National Nutrition Conference called by the President in 1941.

Nutrition Education Emphasized

Following the 1940 State Nutrition Conference, it was evident that some form of local voluntary organization was indicated, so that trained personnel in the schools and colleges, in the agricultural extension service could cooperate with the State agencies in meeting the great public demand for organized class work. The inter-departmental group became the State Nutrition Committee, and representative county and city nutrition committees were organized for the promotion of nutrition education.

As a consequence of this state-wide organization, the work of the staff nutritionists has changed somewhat. Instead of teaching all groups requesting class work, they assist the local committees toward assuming at least part of the responsibility for group teaching, thus effecting much broader coverage than was possible formerly. At the same time, the three staff nutritionists were unable to meet the demand for their services; accordingly, provision for two more nutritionists was included and approved in the Federal Social Security budget for 1942-1943. Before appointments could be made, however, the State Nutrition Committee which had been a recognized cooperating agency of the State Council of Defense became one of three agencies constituting the Office of War Nutrition Services under the State War Council, and four of the five members of the proposed nutrition unit have been assigned to this body for the duration of the present war.

The staff nutritionists have made a noteworthy contribution to the health of the people of the state, not only through their regular work in promoting better nutrition among mothers and children, but also through their skillful and devoted efforts throughout the period of the economic depression, and later following the National and State Nutrition Conferences in their work with local committees. All this has involved intensive study and planning, making current local price surveys of foodstuffs, to correlate them with the requirements of the "National Nutrition Yardstick"; early-hour marketing for suitable supplies for demonstrations; early and late hour preparation of foods preliminary to class-work; assembling suitable equipment; planning for student participation; preparing discussion helps, and many other details involved in dynamic instruction.

Food Practices Change

To categorically state the achievements of the nutrition program of the State Department of Health is to attempt to give definite expression to many and complex intangibles. That there has been a change in food practices of people is indicated by the increased consumption of fruits, vegetables, milk and milk products, which has taken place in the last few years.

In 1922, rickets was not an uncommon disease among children, and cases of scurvy came into the hospitals frequently. Now they are so rare that there are not cases for teaching purposes for

medical students and nurses. The deaths of infants from gastrointestinal diseases have declined markedly, and while this has been due in good part to public health measures to provide safe milk supplies, the nutritionists have played a part in this achievement, in their efforts to see that everyone should know of the contribution of milk to total health, and why expectant mothers and children must have milk and that pasteurization is necessary.

The United States has never produced much more than seventy percent of what has been needed, if all our people could have their basic needs satisfied. With the scarcity of farm labor, the gigantic needs of the armed forces, the requirements of "Lend-lease", and the difficulties in transportation and distribution, it is only too evident that substitutes and shortages will need to be dealt with to an extent that is difficult to imagine. It will be an era when we shall need every bit of knowledge and help that the trained nutritionist can contribute. We need to train more of them and employ more of them in every enterprise, public or private, that concerns itself with the maintenance of health and endurance of people.

NUTRITIONAL ACTIVITIES OF CITY HEALTH DEPARTMENTS

To what extent are our city health departments engaging in nutritional activities? To find the answer to that question, a questionnaire was sent to 58 cities outside of New York City and to 3 counties which have assumed the health function for municipalities within the counties.

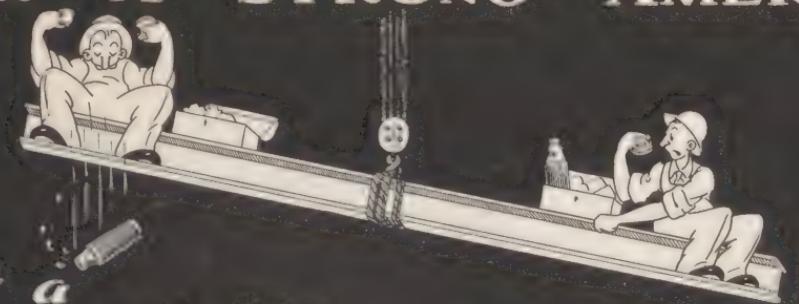
Responses received from 44 of the 58 cities and from the three counties, Westchester, Nassau and Suffolk, clearly indicate that our municipal health departments are not active in nutritional work. Such nutritional activity as is carried on in our local communities is being performed by private organizations and nutritional committees. Only in rare instances are our local health departments working to improve the diets of the people within their respective areas.

TABLE I
EXTENT OF SURVEY

	Questionnaires sent to	Replies received from
Cities	59	45
Counties	3	3

TABLE II
QUESTIONNAIRE RESPONSES

	Yes	No
1. Do you have a nutrition program for your community?	14 cities	31
	2 counties	1
2. Please Describe the organization that handles this program.		
American Red Cross.....	9	
Local Health Association.....	4	
"Private Agencies"	1	
Canteen Corps	1	
"Charities"	1	
County Nutrition Committees.....	12	
County Health Departments.....	2	
City Nutrition Committees.....	2	
Local War Councils.....	3	
Child Health Station.....	3	
Baby Clinics	2	
Nurses	2	
City Health Department.....	1	
Welfare Commissioner	1	
Schools	6	
Total	50	
3. Please list duties, title and compensation of every person assigned to nutrition work.		
No extra help.....	7	
Nutritionist	1	
Volunteers	6	



Eat a Balanced Diet

VEGETABLES-FRUTS-MILK, CHEESE-EGGS-MEAT, FISH OR
POULTRY-WHOLE GRAIN OR ENRICHED BREAD AND CEREALS



THE NEW YORK CITY NUTRITION PROGRAM

By Ernest L. Stebbins, M.D.

Commissioner of Health, City of New York

THE New York City Nutrition Program, so-called because in it are joined five City departments and more than a dozen voluntary health and welfare agencies, was officially launched in December, 1941. The basic aim of the Program is to bring essential food facts to New York City's seven and a half million people by stressing the following points through food selection and cooking classes, meetings and demonstrations, in literature and posters, and through the radio, newspapers and magazine articles:

- 1.—What an adequate diet is and why we need it.
- 2.—How to include it every day.
- 3.—How to buy against a rising market.
- 4.—How to prepare foods to preserve their full flavor and health values.
- 5.—Eliminating waste to conserve food for the war effort.

Five municipal departments—Health, Markets, Welfare, Hospitals and Education—parochial and private schools of this City, the Office of Civilian Defense, the Red Cross, the Nutrition Committee of Greater New York, and many other health and welfare organizations are joined in the Program. Stemming from the leadership of Mayor LaGuardia, a Commissioners' Committee of

the five official departments supervised this Citywide educational campaign, with Coordinating and Technical Committees including representation from a score of cooperating groups. These latter committees were made up of the City's leading nutritionists, dietitians and home economists and it was under their direction that the work was carried forward through twenty Local Planning Groups in the health center districts in the five boroughs.

While important progress has been made during the past year in nutrition work in this City, it should be recognized that this was built on the substantial foundation of nutrition work carried on for many years by official and voluntary agencies. For years prior to the Citywide Nutrition Program, the Health Department conducted work in this field through its health centers and child health stations. Home economics staffs have long been active in the City's school system through the Board of Education and in relief offices throughout the City through the Department of Welfare. Dietitians in City and private hospitals not only insured wholesome diets for the sick but have carried forward educational work through their institutions. The Department of Markets has rendered real service through the years by its Bureau of Consumers Service. In the voluntary field a great amount of work has been done by the Red Cross, the Community Service Society, Catholic Charities, Jewish Social Service, the visiting nurse services and others.

Thus it can be seen that nutrition work was not a new educational venture that suddenly came into being about a year ago. Nutrition has always been important but it has become especially so in these days of war and with the impetus given by the National Nutrition Conference called in Washington in the spring of 1941, it was decided to combine forces here in New York City for a concerted Citywide Program.

With its deep-rooted educational program that reaches into the heart of community life through the establishment of local district health centers, the City was well-equipped with the necessary outlets for carrying forward such a Citywide Nutrition Program, and it was a comparatively simple organizational step to utilize these health centers as headquarters from which the twenty Local Planning Groups could carry forward the nutrition work. In most cases the Local Planning Group is headed by the district health officer and membership includes representatives of the cooperating City departments and the voluntary agencies working in the local area. It was through these Local Planning Groups that meetings, lectures and demonstrations were planned and organized for churches and schools, for settlement houses and civic clubs and for the many other community groups. Nutrition literature and posters were made available to these Local Planning Groups for distribution to the people.

In addition to the work carried forward from the health centers, many citywide channels were used in bringing essential food facts to the people. Major restaurant chains, including Horn and

Hardart's, Schrafft's, Bickford's, Stewart's and the Consumers Cooperatives, distributed literature and joined in the educational work. The Consolidated Edison Company, through its publication "Greater Service News" which monthly goes to about two million subscribers in the Boroughs of Manhattan, Brooklyn, Queens and Richmond, distributed many thousands of copies of nutrition literature. Savings banks, through their house organs, cooperated. Many food stores throughout the City were part of the Program. Very effective work has been done with many of the large department stores, particularly in educational work with their personnel. Through the Board of Transportation, nutrition posters were placed in all subways, elevated trains, trolleys and buses of the City's transit system, urging a balanced diet for a strong America and listing the foods that should be included every day.

Central office staff and quarters for the Nutrition Program were supplied by the Health Department, with considerable technical assistance given by the other City departments and the voluntary agencies cooperating. Printed materials were supplied by the City departments and through special funds that were available from grants by the New York and Nathan Hofheimer Foundations. Literature was also supplied in quantities by the Welfare Council of New York City, the Nutrition Committee of Greater New York and the New York Times, and several commercial firms who made reprints of literature authorized for the Program.

It should be pointed out here that Program activities during the past year were carried forward with serious budget limitations which prevented, among other things, the hiring of a sufficient number of nutritionists to conduct cooking classes and lectures in all parts of the City. The substantial strides of the Program would not have been possible without the services of more than 300 nutritionists, dietitians and home economists who volunteered their services through a central speakers' bureau and without the donations of money and materials that came from public-spirited citizens and organizations.

Yet with the limitations of budget and staff, a review of the Program shows that considerable progress has been made in giving this City's millions of residents the necessary knowledge about foods to safeguard their health. **Almost 3,000,000 pieces of nutrition literature were distributed, a total of 3,000 lectures and food selection and cooking classes were held and hundreds of special programs and events were staged in health center districts throughout the City to stimulate interest in nutrition.** One of the nutrition booklets, "Food Joins the Colors", has had a fine reception wherever it was distributed and many national business organizations have been given permission to reprint, including the Westinghouse Electric and Manufacturing Company, the Dairy-men's League, General Motors Company, Cooperative League of the U.S.A., and others. It was gratifying to hear from the Westinghouse people in East Pittsburgh that after the distribution of this booklet there was a 300% increase in consumption of the fruit

which their workers can buy from carts which circulate through the plant in between meal-times.

Three hundred thousand copies of "Food Joins the Colors" have been distributed at a cost of about two cents a copy or \$6,000; also, 200,000 sets of reprints of the ten food articles in the nutrition issue of "Neighborhood Health"—a total of 2,000,000 reprints—which cost about \$1,900 and 40,000 copies of the complete nutrition issue of "Neighborhood Health" at a cost of about \$600. About 500,000 copies of a series of four nutrition leaflets were made available by the Welfare Council of New York City as a contribution by that organization to the Citywide Program. In addition, about 100,000 pieces of literature were supplied free by commercial organizations and national magazines, as well as materials from the National Nutrition Program in Washington and other governmental agencies. A variety of mimeographed materials were supplied to chairmen and members of Local Planning Groups, to volunteer speakers and to newspaper and magazine writers for news and feature stories.

In addition to the 300 volunteer nutritionists, dietitians and home economists who liberally gave of their time through the central speakers' bureau in conducting meetings and cooking classes throughout the City, more than fifty experts in the field of nutrition, recruited from the various official departments and voluntary agencies prepared the substantial amount of printed materials necessary for the Citywide Program. These technical committees prepared (1) an authoritative bibliography of nutrition literature, (2) a list of approved motion pictures on food and nutrition, and (3) an alertness credit course in nutrition for elementary and high school teachers. There has been a demand for these mimeographed publications from persons interested in nutrition throughout the country.

The New York City Nutrition Program has had the active cooperation and full support of the Nutrition Committee of Greater New York, the group designated as official coordinating group in this area for the National Nutrition Program. This Committee, headed by Dr. Grace MacLeod, Professor of Nutrition at Teachers College, has given invaluable assistance to the Program. It is the six-lesson course in food selection and cooking prepared by this Committee that has been used as the official course for our Program. The course has been planned to include adequate, economical meals for the family and is given in two-hour sessions held once or twice a week. The method of presentation includes lectures and discussions on the basic essentials of adequate food for the family and demonstrations on practical food preparation, using very simple equipment. Subjects of the six lessons are: (1) Milk for Everybody, (2) Vary Your Vegetables and Fruits, (3) Breads and Cereals—Attractive Combinations, (4) Making the Most of Your Meat and Fish, (5) Eggs, Beans and Peas Used as Main Dishes in View of Voluntary Meat Rationing, and (6) How Does Your Family Measure Up in Providing a Balanced Diet. With our country being

called upon to make food available for our Allies as well as for our own armed forces, the food selection course and lectures and demonstrations stress the fact that not one particle of food can be wasted, and housewives are given many hints on utilizing left-overs and other ways of conserving food supplies.

While all this may sound a rather glowing account of progress for a program that has been under way now for about a year, it should be pointed out that in planning the work ahead many problems confront us, particularly in the matter of budget and staff. City departments and voluntary agencies as well are being drained more and more of personnel for our armed forces. It has become increasingly difficult in recent months to find professionally trained people as volunteer speakers for the Program. For instance, where in the past many hospital dietitians were able to conduct cooking classes and demonstrations, it is now almost impossible for them to do so because of the increase in the load of their own work. The same holds true for the full-time personnel of other departments and commercial companies, all of whom have taken on extra assignments because of the war.

But if nutrition work was important in peacetime and in the year that has passed since our own nation has been at war, it is even more important now, with serious problems in food shortages, rationing and rising prices confronting us. We will meet these challenges successfully if, as in the past, municipal, state and federal agencies and voluntary groups work hand in hand.

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APPENDIX A

**RESOLUTION CREATING THE NEW YORK STATE JOINT
LEGISLATIVE COMMITTEE ON NUTRITION****FEBRUARY 18, 1942****BY MR. DESMOND:**

WHEREAS, One-third of the draftees found unfit for service have been rejected directly or indirectly because of nutritional deficiencies; and

WHEREAS, Unknown thousands of our people are suffering from "hidden hunger", due to nutritional deficiencies; and

WHEREAS, Nutritional experts believe that the production of our defense workers can be stepped up ten per cent by proper eating; and

WHEREAS, Nutrition is more than a temporary, war-time need, and is, in fact, a proper and permanent concern of government; and

WHEREAS, There is an urgent need for a full and complete study of the nutritional work now being performed by state and local agencies, both public and private; and

WHEREAS, There is an urgent need for development of a sound statewide nutritional program which will determine the proper role the state should play in putting the relatively new science of nutrition to work in promoting the health of our people; now, therefore be it

RESOLVED (if the Assembly concur) That a joint legislative committee is hereby created to consist of four members of the Senate to be appointed by the Temporary President of the Senate and ~~three~~ four members of the Assembly to be appointed by the Speaker of the Assembly with full power and authority to proceed with a study and investigation of the proper role the state should play in relationship to nutrition. Such study to include a study of (1) the need for creating a new division or bureau of nutrition in the State Department of Health; (2) the need for organizing special nutritional programs for workers in defense industries; (3) the need for coordinating the nutritional work of the state with the new nutritional program undertaken by the federal government; (4) the need for eliminating any duplication in nutritional work; and (5) the need for setting up community demonstration centers; and be it further

RESOLVED (if the Assembly concur). That the study and investigation hereby authorized is not limited to specific matters herein mentioned or enumerated but the committee in the conduct of such investigation may inquire into every matter and thing considered to be relevant to the problems of nutrition, even though not specifically mentioned therein to the same extent as though

specific power and authority therefor were expressly granted herein; and be it further

RESOLVED (if the Assembly concur), That such committee shall organize by the selection from its number of a chairman, a vice-chairman and a secretary and shall employ and may at pleasure remove a research director and other employees and assistants as may be necessary, and fix their compensation within the amounts made available therefor herein. Any vacancy in the membership of the committee shall be filled by the officer authorized to make the original appointment. The members of the committee shall serve without compensation for their services but shall be entitled to their actual expenses incurred in the performance of their duties hereunder. Such committee may sit at any place within the state as it may determine to conduct its labors, and it may hold either public or private hearings. Such committee or any member thereof shall have power to subpoena witnesses, administer oaths, take testimony and compel the production of books, papers, documents and other evidence and it shall have generally all the powers of a legislative committee as provided by the legislative law. Such committee may request and shall receive from all public officers and departments and agencies of the state and its political subdivisions, such assistance and data as will enable it properly to consummate its investigations; and be it further

RESOLVED (if the Assembly concur), That the committee shall report to the legislature on or before March first, nineteen hundred and forty-three the results of its study and investigations and shall submit with its report such legislative proposals as it deems necessary to make its recommendations effective; and be it further

RESOLVED (if the Assembly concur), That the sum of **[\$15,000]** or so much thereof as may be necessary, is hereby appropriated from the legislative contingent fund and made immediately available to pay the expenses of the committee, including personal service, in carrying out the provisions of this resolution. Such moneys shall be payable after audit by and upon the warrant of the comptroller on vouchers certified or approved by the chairman of the committee in the manner provided by law.

To Finance Com. Apr. 14 Rept. amend as indicated in 11th paragraph. Adopted. Apr. 15 In Assembly. Rules Com. Apr. 16 Rept. amended as indicated in 7th paragraph. Adopted. Senate concurs.

APPENDIX B

BRITISH REGULATIONS**BRITISH FACTORY CANTEEN REQUIREMENT****STATUTORY RULES AND ORDERS****1940 No. 1993****EMERGENCY POWERS (DEFENCE)****Factories (Canteens)**

THE FACTORIES (CANTEENS) ORDER, 1940, DATED NOVEMBER 11, 1940, MADE BY THE MINISTER OF LABOUR AND NATIONAL SERVICE UNDER REGULATION 60 OF THE DEFENCE (GENERAL) REGULATION, 1939.

In pursuance of the powers conferred on him by Regulation 60 of the Defence (General) Regulations, 1939, and of all other powers enabling him in that behalf, the Minister of Labour and National Service (hereinafter referred to as "the Minister") hereby makes the following Order:—

1. The occupier of any factory in which more than 250 persons are employed and in which is carried on the manufacture or repair of any munitions of war or of any materials, parts or tools required for such manufacture or repair, or any work on behalf of the Crown shall, if so directed on behalf of the Minister by the Chief Inspector of Factories or by any other Inspector of Factories expressly authorised by the Minister to give directions under this Order, make arrangements to the satisfaction of the Inspector for the establishment and maintenance, in or in the immediate vicinity of the factory, of a suitable canteen attached to the factory or to a group of factories where hot meals can be purchased by persons employed at the factory or factories.

2. This Order may be cited as the Factories (Canteens) Order, 1940, and shall come into force on the date hereof.

Signed by Order of the Minister of Labour and National Service this eleventh day of November, 1940.

T. W. PHILLIPS,
Secretary of the Ministry of Labour
and National Service—Great Britain

Scale of Allowances of Food to
Industrial Catering Establishments
(as on November 22nd, 1942)

	Category A Industrial Group	Category B Industrial Group
Bacon & Ham:		
Category A Bacon per breakfast.....	2/7 oz.	2/7 oz.
main meal.....	1/7 oz.	1/7 oz.
subsidiary meal.....	1/14 oz.	1/14 oz.
Category F Bacon.....	4 times Cat. A Bacon	4 times Cat. A Bacon.
Butter, Margarine & Cooking Fats per meal (not more than one quarter of the total allowance may be taken in the form of butter and one quarter in the form of cooking fats).....	1/2 oz.	1/2 oz.
Sugar per meal.....	1/5 oz.	1/8 oz.
per hot beverage.....	1/5 oz.	1/8 oz.
Meat (excluding Offal) per main meal.....	2d worth retail	1½d worth retail
Cheese per meal.....	2/7 oz.	2/7 oz.
Preserves (excluding syrup and treacle) per meal.	+ C.F. 1/7 oz.	C.F. 1/7 oz.
Processed Eggs — per 100 meals (per 4 weekly period).....	+ P.M. 3/8 oz.	P.M. 3/8 oz.
Milk:	1 lb.	1 lb.
Liquid — per 100 hot beverages.....	3 pints	3 pints
Processed:		
Unsweetened condensed — per 70 hot bever- ages.....	1 tin	1 tin
Roller skim milk powder — per 100 hot beverages.....	2 ozs.	2 ozs.
per 100 breakfasts and main meals.....	3/4 lb.	3/4 lb.
Points Rationing (4 weekly period)		
per 4 main meals.....	1 point	1 point
per 8 subsidiary meals.....	1 point	1 point
per 8 teas.....	1 point	1 point
per 8 breakfasts.....	1 point	1 point
Tea	1 lb. per 280 hot beverages.	

+ C.F. = Canteens with cooking facilities.
P.M. = Canteens preparing Packed Meals.

Provision of Hot Drinks

Special authorities are issued to employers with no canteen facilities to obtain supplies of tea, milk and sugar, for hot beverages to be brewed communally for their industrial workpeople during working hours.

The scale is as follows:

Tea	4/5ths oz. per worker per week
Sugar	1 oz. per worker per week
Milk	½ pint per worker per week

Certain classes of industrial workers such as blast furnacemen, tinplate workers and salt workers who, because of the temperatures in which they work or for other reasons need to drink an exceptional quantity of liquid, are allowed a higher scale:

Tea	2½ oz. per worker per week
Sugar	3 oz. per worker per week
Milk	1½ pints per worker per week

“Dry” Tea, Milk and Sugar for certain Railwaymen. Certain classes of railwaymen, i.e. engine drivers, firemen, guards, signalmen, permanent way men, shunters and some clerks cannot benefit from the tea concession because the conditions of their work make it impossible to supply liquid tea for groups. Only in these circumstances may tea, milk and (except in the case of railway clerks) sugar, be issued to them in “dry” form by a responsible officer of the Railway Company.

Priority Supplies of Unrationed Foods

Canteens serving and hotels accommodating workers, which for the purpose of obtaining supplies of rationed foods are classified in Category A or B Industrial Group, rank as priority establishments and are entitled to the following priority allowances of certain unrationed foods:

Cake and Flour Confectionery	25 lbs. per 1,000 subsidiary meals
	60 lbs. per 1,000 teas
Cocoa Powder	2 lbs. per 1,000 teas
Starch Food Powders	5 lbs. per 1,000 main meals
Sugar for Priority Beverages	2 lbs. per 1,000 subsidiary meals
	4 lbs. per 1,000 teas
Coffee Essence	Allocations made on limited scale against special application to the Food Executive Officer. In general, applicants must be without apparatus for brew- ing coffee, or need to serve it when apparatus is not ready.
Shredded Suet	5 lbs. per 1,000 main meals

NOTE: For every lb. of sugar allowed for priority beverages establishments may obtain from a manufacturer either:

- (a) ½ gallon of fruit juices, syrups or squashes; or
- (b) 2 gallons of non-alcoholic cordials and herbal or botanic beers.

The beverage manufacturer, to whom the sugar permit is handed by the establishment, passes it to his normal sugar supplier. In return, he supplies to the establishment the beverage required on the basis of the above scale.

Definition of Meals

The definition of meals on which allocations of food to catering establishments are based is as follows:

“Main meal” means a meal, other than breakfast, at which is served a course, other than sandwiches or snacks, containing a portion of meat, fish, poultry or game, or a substantial course corresponding to a meat course.

“Subsidiary meal” means: (a) a meal, other than breakfast, the principal course of which consists of sandwiches or snacks, or (b) a meal, other than a tea, which, although served during the usual dinner, luncheon, high tea or supper period, contains no course such as constitutes a main meal.

“Breakfast” means a substantial meal served during the normal breakfast period, e.g. a meal containing porridge, fish, bacon or sausage would count as a breakfast, but a roll and coffee would not, and would count as a tea.

“Tea” means a meal at which tea or other beverage is served with light comestibles such as bread and butter, cakes or biscuits, but does not include beverages served alone.

APPENDIX C

QUESTIONNAIRE OF EATING FACILITIES IN WAR INDUSTRIES

NEW YORK STATE DEPARTMENT OF LABOR

PLEASE ANSWER ALL QUESTIONS ENCIRCLING “YES” OR “NO” AS EACH APPLIES. WRITE ANY COMMENTS ON OTHER SIDE OF THIS SHEET

1. NAME OF PLANT.....
2. ADDRESS: Street..... Town or City..... County.....
3. Nature of Industry.....
4. Approximate number of Factory Employees: a. Male... b. Female... c. Total...
5. How much time is allowed for lunch? minutes. Are there exceptions
Yes No
6. If so, specify what.....
7. Approximately what percentage of employees eat lunch at home?.....percent
8. Are outside restaurants easily available in your immediate vicinity? Yes No
9. Are employees permitted to leave plant to eat in them?.....Yes No
10. Approximately what percent bring their own lunch?.....percent
11. Have you a room where workers eat lunch?.....Yes No
12. Is it equipped with seats?..Yes No. 13. Approx. seating capacity.....
14. Can employees buy food?....Yes No. 15. If so, specify below:
 - a. Sandwiches
 - b. Hot food other than beverages.....
 - c. Milk
 - d. Fruit
 Yes No
16. Is sale of food handled by a concessionaire?.....Yes No
17. By Company itself.....Yes No
18. Is any food supplied free at your plant?—Yes No. 19. If so, what.....

20. Are food carts used? Yes No 21. Do they circulate between meals? Yes No
 22. Do these carts serve:
 a. Sandwiches Yes No
 b. Hot food other than beverages Yes No
 c. Milk Yes No
 d. Fruit Yes No
 e. Other (specify) Yes No
 23. Have you food vending machines? Yes No
 24. Candy vending machines? Yes No
 25. Can workers go to vending machines whenever they wish? Yes No
 26. If not, when can they go?
 27. Do you consider the available eating facilities for your workers adequate? Yes No
 28. Would you care to have technical assistance in improving eating facilities in your plant? Yes No
 Signed Title Date

After Completion, Mail to Division of Industrial Hygiene—New York State Department of Labor, 80 Centre Street, New York City

APPENDIX D

STATE LAWS REGARDING FORTIFICATION OF FLOUR, BREAD AND OLEOMARGARINE

South Carolina

ENRICHED FLOUR AND ENRICHED BREAD

*Issued by South Carolina Department of Agriculture—
July 1, 1942*

J. ROY JONES, Commissioner

AN ACT to Require the Enrichment of White Bread, White Flour and Self-rising Flour by the Addition of Certain Vitamins and Minerals and to Prescribe the Methods of Enrichment and Fix Penalties for Violation of Same; and to Provide Appropriation for Enforcing Same.

WHEREAS, There exists a wide spread deficiency of certain constituents in foods necessary to health and well-being of the consumer and to protect so far as may be possible the health of the people of South Carolina against such deficiency by providing for the addition of such necessary constituents, normally present in wheat, to flour and to bread, and to provide formulas for such addition and rules for its enforcement.

Be It Enacted by the General Assembly of the State of South Carolina:

Section 1. On and after the effective date of this Act it shall be unlawful for any person, firm or corporation except as hereinafter provided to manufacture, mix, compound or sell for

human consumption in the State of South Carolina any white flour or self-rising flour (made from wheat) which does not contain the vitamins and other ingredients contained in the following formula:

(a) White flour shall contain in each pound not less than 1.66 milligrams and not more than 2.5 milligrams of vitamin B-1 (thiamin) not less than 6 milligrams and not more than 24 milligrams of nicotinic acid (also recognized under the name of niacin) or nicotinic acid amide (also known under the name of niacin amide), not less than 6 milligrams and not more than 24 milligrams of iron (Fe).

(b) If other vitamins or minerals are added to bread or flour they shall be added only in accordance with the regulations of the Federal Security Agency.

(c) These ingredients and amounts are in accordance with the definition of enriched flour as promulgated by the Federal Security Agency. (Federal Register, May 27, 1941, P. 2574 to 2582 and December 3, 1941, P. 6175 and 6176, postponing the effective date of riboflavin as a required ingredient in enriched flour). The State Department of Agriculture is empowered with the authority and is directed, to change or add to the specifications for ingredients and the amounts thereof required to conform to changes in the Federal definition of enriched flour.

(d) Iron shall be added only in forms which are harmless and assimilable. The substances referred to in Section 1 (a) and 1 (b) may be added in a harmless carrier which does not impair the enriched flour or enriched self-rising flour, such carrier is used only in the quantity necessary to effect an intimate and uniform admixture of such substances with the flour.

Section 2. All white bread sold, or offered for sale, within the State of South Carolina shall be enriched to contain in each pound, as sold, not less than 1.0 milligrams and not more than 2.0 milligrams of vitamins B-1 (thiamin), not less than 4.0 milligrams and not more than 16.0 milligrams of nicotinic acid (niacin) or nicotinic acid amide (niacin amide), not less than 4.0 milligrams and not more than 16.0 milligrams of iron (Fe).

(a) The enrichment of white bread may be accomplished through the use of enriched flour, enriched yeast, other enriched ingredients, synthetic vitamins, harmless iron salts or by any combination of methods which will produce enriched bread which meets the standards herein defined.

(b) The State Department of Agriculture is empowered with the authority and directed to change, or add to, the specifications for ingredients and the amounts thereof required to conform to the Federal definition of enriched bread when promulgated.

Section 3. All enriched flour or bread sold in the State of South Carolina must be labeled in accordance with the regulations of the Federal Security Agency, governing enriched flour or enriched bread sold in interstate trade.

Section 4. The provisions of this Act shall be enforced by the Department of Agriculture, which department is authorized and

directed to issue such rules as may be necessary to regulate the manufacture and sale of flour and bread in this State under the provisions of this Act. The department or its agent representatives shall have authority to enter upon the premises of any manufacturer of flour or bread, and of any wholesale or retail dealer in flour or bread, for the purpose of inspecting or analyzing flour or bread which may be offered for sale; and any person, firm or corporation found guilty of violating the terms of this Act shall be subject to fine for each and every offense, in a sum not exceeding \$100.00 or imprisonment not exceeding thirty days.

Section 5. The terms of this Act shall not apply to flour ground for the wheat producer whereby the miller is paid in wheat or feed for the grinding service rendered, except insofar as such a mill may manufacture toll wheat into flour and sell or offer for sale such flour, whereupon this Act shall be applicable, nor shall the provisions of this Act apply to farmers in exchanging their wheat for flour, or having the same ground into flour and disposing of the same for their own use, or the use of farm labor on their farms.

The terms of this Act as regards flour shall not apply to flour sold to bakers or other commercial secondary processors providing the purchaser furnishes to the seller an approved certificate of intent to use said flour solely in the production of enriched flour or enriched bread as herein defined or in the manufacture of legitimate products not covered by the provisions of this Act.

The terms of this Act shall not apply to flour or bread which is made from the entire wheat with no parts of the wheat removed from the mixture. In cases of flour or bread containing mixtures of the whole wheat berry and white flour or mixture of various portions of the wheat berry such products shall have a vitamin and mineral potency at least equal to enriched flour or enriched bread as described in Sections 1 and 2 of this Act.

Section 6. Whenever any person, firm or corporation subject to the provisions of this Act shall submit to the Commissioner of Agriculture an affidavit claiming a shortage or imminence of shortage of any vitamin or mineral element added to a food as required by this Act the Commissioner shall request information from the War Production Board or other Federal Agency responsible for information concerning said availability.

If factual information can be obtained within ten days from said source this information shall be considered as final and the South Carolina Commissioner of Agriculture is hereby instructed to act thereon. However, if said information is not available the Commissioner of Agriculture shall hold a public hearing within ten days. If in the judgment of the Commissioner, the testimony presented shows that the sale and distribution of a food may be substantially impeded by the enforcement of the provisions of this Act, he shall immediately suspend such parts of the Act which may impede such sale: PROVIDED, such sus-

pension shall be revoked as soon as adequate supplies of such vitamins and minerals become available in the judgment of the Commissioner based on information from said Federal agencies or testimony at a public hearing.

Section 7. There is hereby appropriated from the general funds of the State the sum of Twenty-five Hundred (\$2,500.00) Dollars, or so much thereof as may be necessary, available to the Department of Agriculture, to be used by it in enforcing the provisions of this Act during the fiscal year 1942-43.

Section 8. All Acts or parts of Acts inconsistent with the provisions of this Act are hereby repealed to the extent of such inconsistency.

Section 9. This Act shall take effect August 1, 1942.

Signed: R. M. JEFFRIES,
Governor.

March 14, 1942.

**Rules and Regulations for enforcement of "Enriched Flour and Enriched Bread Act" Promulgated by The Commissioner of Agriculture,
June 18, 1942**

For the purpose of Administration of the provisions of the Act—"To Require the Enrichment of White Bread, White Flour and Self-rising Flour by the Addition of Certain Vitamins and Minerals and to Prescribe the Methods of Enrichment and Fix Penalties for Violation of Same; and to Provide Appropriation for Enforcing Same."

Rules and Regulations are hereby promulgated by the Commissioner of Agriculture for the State of South Carolina, in accordance with Section 4, of the said Act:

Definition of White Flour: "The term 'white flour' includes and shall be limited to flour made wholly from wheat which conforms the definition and standard of identity for white flour, promulgated by the Federal Security Agency (Federal Register of May 27, 1941, Page 2579).

Definition of Self-Rising Flour: "The term 'self-rising flour' includes and shall be limited to self-rising flour which conforms to the definition and standard of identity of self-rising flour, promulgated by the Federal Security Agency (Federal Register of May 27, 1941, Page 2580).

Exclusion of Certain Flour: Provided, however, that special flours not used for bread and biscuit baking, such as cake, pancake, pastry flours and other specialty flours, shall be excluded.

Labeling: All containers, such as cloth and paper bags, barrels, and other containers for white flour and for self-rising flour must be labeled in accordance with the Federal Security Agency's regulations for foods for special dietary uses (Federal Register November 22, 1941, Page 5925), so as to carry information as to minimum daily requirements of required ingredients for adults.

Specimen wording of label submitted below contains the above information, and either these, or similar ones, are acceptable.

ENRICHED FLOUR

"10 ozs. of this flour contains not less than the following proportions of the minimum daily requirements of Vitamins B-1, 100%; Iron 37% and 3.75 mg. of Niacin (another B. Vitamin)."

OR

ENRICHED FLOUR

"8 oz. (2 cups) contains 83% of the Vitamin B-1, and 30% of the Iron required daily as a minimum for an adult; also 3 mg. Niacin."

Labels shall be printed on bags, or other containers, in type large enough to be easily read.

Temporary Exceptions: Until the supply of containers, now on hand is exhausted, labels may be applied by rubber stamps, sewed-in-tags, overprinting, or any other practical method, with the distinct understanding that this is for the purpose of liquidating the present supply of containers.

Baker's Certificate: Bakers or other commercial secondary processors purchasing flour non-enriched shall prepare an approved certificate, in triplicate. This certificate must be approved by the Commissioner of Agriculture—one copy to be furnished his office, the other copy to be retained by the purchaser, and the original to be furnished the supplier of the non-enriched flour. Said certificate may be in the form of a blanket certificate to cover all purchases from each supplier for an indefinite period of time, or a separate certificate may be furnished with each purchase order. The law does not state the form of certificate to be used; however, the following form is suggested:

Suggested Certificate: This is to certify that the flour purchased by me, or us, from you, is to be used solely in the production of enriched flour or enriched bread, as defined in the Act of the General Assembly, "To Require the Enrichment of White Bread, White Flour and Self-rising flour, etc"—or in the manufacture of legitimate products not covered by the provisions of this Act or rules of Administration set up by the Commissioner of Agriculture. This certificate is to remain in force until written notice of its cancellation.

Definition of Bread: For the purpose of administering this Act, bread shall mean that product, in the form of loaves, obtained by baking dough consisting of flour, leavened mixture, with water and/or other liquid and with or without the addition of other edible substances.

Exceptions: Our opinion of the intention of the General Assembly in passing this Act was for the provisions of the Act to apply to what is generally known as white bread, and not to be

applied to such specialties as cakes, pastry, rolls, buns, crackers, raisin bread, cheese bread, banana bread, or 'other special bakery products'.

Bread Labeling: All white bread sold, or offered for sale within the State of South Carolina shall bear a label in accordance with the provisions set up by the Federal Security Agency containing information such as given for flour, and the following is suggested:

ENRICHED BREAD

Six ounces of this bread contains not less than the following proportions of minimum daily requirements of Vitamin B-1, 37½%; Niacin (another 'B' Vitamin)—1.5 mgs; Iron, 15%.

Applying Labels: A label must be on each individual loaf, either printed on the wrapper, or on a band around the wrapped bread, or labeled by any other practical method.

Approved:

J. ROY JONES, *Commissioner,*
Department of Agriculture
Columbia, South Carolina.

FORTIFIED OLEOMARGARINE

AN ACT providing for the Addition of Vitamins to Oleomargarine Sold in the State of South Carolina, and Fixing the Penalty for Violation of the Same; and Providing Appropriations for Enforcing the Same.

WHEREAS, Oleomargarine, both plain and fortified, is widely used as an edible fat, and as a substitute for butter which always contains at least some vitamin A, vitamin D even during the winter season. Unfortified oleomargarine, although a wholesome food, does not contain Vitamin A. To help protect the health and well-being of the people of the State of South Carolina this Act provides for the addition of Vitamin A to oleomargarine in amounts which will make its Vitamin A potency equal to that of good butter. This Act also provides formulas for such addition and rules for its enforcement.

Be It Enacted by the General Assembly of the State of South Carolina:

Section 1. After the passage of this Act it shall be unlawful for any manufacturer, processor or dealer in oleomargarine in the State of South Carolina to sell or offer for sale any such product within this State which does not contain at least 9,000 United States Pharmacopeia Units of Vitamin A per pound.

Section 2. The State Department of Agriculture is empowered with the authority and is directed to change, or add to, the specifications for ingredients and the amounts thereof required to conform to any changes in the ruling of the Federal Security Agency concerning the addition of vitamins to oleomargarine. Federal Register—Volume 6, page 2763 (June 7, 1941).

Section 3. The State Department of Agriculture is empowered and directed to enforce this Act. This department shall have the right, for the purpose of enforcing this Act, to enter upon the premises of any manufacturer, processor or refiner, or upon the premises of any person engaged as a retail or wholesale dealer in oleomargarine, for the purpose of making such investigations as may be necessary to properly enforce the same. Any person found by a court of competent jurisdiction to be guilty of violating the terms of this Act shall be punishable by a fine of not more than One Hundred (\$100.00) Dollars, or by imprisonment for not more than thirty days for each and every offense.

Section 4. Whenever any person, firm or corporation subject to the provisions of this Act shall submit to the Commissioner of Agriculture in an affidavit claiming a shortage or imminence of shortage of any vitamin added to oleomargarine as required by this Act, the Commissioner shall request information from the War Production Board or other Federal agency responsible for information concerning said availability. If factual information can be obtained within ten days from said source this information shall be considered as final and the South Carolina Commissioner of Agriculture is hereby instructed to act thereon. However, if said information is not available the Commissioner of Agriculture shall hold a public hearing within ten days. If, in the judgment of the Commissioner, the testimony presented shows that the sale and distribution of oleomargarine may be substantially impeded by the enforcement of the provisions of this Act, he shall immediately suspend such parts of the Act which may impede such sale; provided such suspension shall be revoked as soon as adequate supplies of such vitamin become available in the judgment of the Commissioner, based on information from said Federal agencies or testimony at a public hearing.

Section 5. All oleomargarine sold in the State of South Carolina must be labeled in accordance with the regulations of the Federal Security Agency governing the labeling of oleomargarine with added vitamin sold in interstate trade.

Section 6. There is hereby appropriated from the general funds of the State the sum of twenty-five hundred dollars or so much thereof as may be necessary, available to the Department of Agriculture, to be used by it in enforcing the provisions of this Act during the fiscal year 1942-43.

Section 7. All Acts or parts of Acts inconsistent with the provisions of this Act are hereby repealed to the extent of such inconsistency.

Section 8. This Act shall take effect July 1, 1942.

Signed: R. M. JEFFRIES.

March 14, 1942.

Governor.

Louisiana**ENRICHED FLOUR AND BREAD****Act No. 202 of 1942**

AN ACT to regulate the manufacture, baking, mix, compound, sale or offer for sale for human consumption of flour and bread as defined herein, and to require the enrichment of flour and bread by the addition of certain vitamins and minerals and to prescribe the methods of enrichment; authorizing the President of and the Louisiana State Board of Health, to change, or add to, the specifications for ingredients and amounts thereof; providing the method of enrichment; and authorizing the Louisiana State Board of Health to prescribe rules and regulations as prescribed herein to carry out to provisions of this Act; authorizing the Louisiana State Board of Health to determine the availability of the necessary ingredients; defining the terms used herein; fixing active enforcement date; and to fix penalties for violation of same,

WHEREAS, There exists a widespread deficiency of certain ingredients in foods necessary to the health and well-being of the people, and it is, therefore, necessary and advisable to protect so far as may be possible the health of the people of this State against such deficiency by providing for the addition of such necessary ingredients, normally present in wheat, to certain kinds of flour and bread, and to provide formulas for such addition and rules for its enforcement.

Section 1. Be it enacted by the Legislature of Louisiana that when used in this Act,

(a) The term "flour" includes and shall be limited to flour of every kind and description made wholly or partly from wheat which conforms to the definitions and standards of identity of flour, white flour, wheat flour and plain flour as promulgated by the Federal Security Agency (Federal Register, Vol. 6, pp. 2574-82, May 27, 1941), but excludes whole wheat flour made only from the whole wheat berry with no part thereof removed, and also excludes special packaged flours not used for bread making, such as cake, pancake, cracker, and pastry flours;

(b) The term "bread" includes and shall be limited to bread of every kind and description made wholly or partly from wheat flour which conforms to the definition and standard of identity of bread as promulgated by the Federal Security Agency (Federal Register, Vol. 6, pp. 2771-72, June 7, 1941), but excludes bread containing no wheat flour or breads made from whole wheat flour;

(c) The term "enrichment" as applied to flour or bread means the addition thereto of vitamins and other ingredients of the nature required by this Act; and the terms "enriched flour" (as defined in Federal Register, Vol. 6, pp. 2579-81, May 27, 1941, and "enriched bread" (as defined in Federal Register, Vol. 6, pp. 2772, June 7, 1941) mean flour or bread, as the case may be, which has been enriched to conform to the requirements of this Act.

(d) The term "President" means President of the Louisiana State Board of Health.

(e) The term "person" means an individual, a corporation, a partnership, an association, a joint stock company, a trust, or any unincorporated organization.

(f) The term "appropriate federal agency" means the Federal Security Agency, or any agency or department or administrative federal officer charged with the enforcement of the Federal Food, Drug and Cosmetic Act.

Section 2. On and after the effective date of this Act it shall be unlawful for any person to manufacture, mix, compound, sell or offer for sale, for human consumption in this State, any flour (as above defined) unless the following vitamins and other ingredients are contained in each pound of such flour:

(a) Not less than 1.66 milligrams of Vitamin B¹ (thiamin); not less than 6 milligrams of nicotinic acid (also recognized under the name of niacin) or nicotinic acid amide (also known under the name of niacin amide); and not less than 6 milligrams of iron (Fe). (These ingredients and amounts are in accordance with the definition of enriched flour as promulgated by the Federal Security Agency [Federal Register, Vol. 6, pp. 2579-82, May 27, 1941; and Vol. 6, pp. 6175-76, December 3, 1941, postponing the effective date of the addition of riboflavin as a required ingredient to enriched flour].)

(b) The enrichment of flour shall be accomplished by a milling process, addition of vitamins from natural or synthetic sources, addition of minerals, or by a combination of these methods or by any method which is permitted by the Federal Security Agency with respect to flour introduced into interstate commerce.

(c) The Louisiana State Board of Health is empowered with the authority and directed to change, or add to, the specifications for ingredients and the amounts thereof required to conform to the State or Federal definition of enriched flour when promulgated or as may be from time to time amended.

(d) If other vitamins or minerals are added to flour they shall be added only in accordance with the regulations of the Federal Security Agency.

(e) Iron shall be added only in forms which are assimilable and harmless and which do not impair the enriched flour.

Provided, however, that the terms of this Act shall not apply to flour sold to bakers or other commercial secondary processors, if, prior to or simultaneously with delivery, the purchaser furnishes to the seller a certificate of intent in such form as the President shall by regulation prescribe certifying that such flour shall be used only in the production of flour or bread enriched within the given establishment to meet the requirements of this Act or shall be used in the manufacture of products other than flour or bread. It shall be unlawful for any such purchaser so furnishing any such certificate of intent to use the unenriched flour so purchased in any manner other than as stated in the certificate.

(f) The terms of this Act shall not apply to flour or bread which is made from the entire wheat berry with no parts of the wheat removed from the mixture. In cases of flour or bread containing mixtures of the whole wheat berry and white flour or mixture of various portions of the wheat berry such products shall have a vitamin and mineral potency at least equal to enriched flour or enriched bread as described herein.

(g) The terms of this Act shall not apply to flour ground for the wheat producer whereby the miller is paid in wheat or feed for the grinding services rendered, except insofar as such a mill may manufacture toll wheat into flour and sell or offer for sale such flour, whereupon this Act shall be applicable, nor shall the provisions of this Act apply to farmers in exchanging their wheat or flour, or having the same ground into flour and disposing of the same for their own use, or the use of farm labor on their farms.

Section 3. On and after the effective date of this Act it shall be unlawful for any person to manufacture, bake, sell or offer for sale, or to receive in interstate shipment for sale for human consumption in this State, any bread (as above defined) unless the following vitamins and other ingredients are contained in each pound of such bread:

(a) Not less than 1.0 milligrams of Vitamin B¹ (thiamin); not less than 4.0 milligrams of nicotinic acid (niacin) or nicotinic acid amide (niacin amide); and not less than 4.0 milligrams of iron (Fe);

(b) The Louisiana State Board of Health is empowered with the authority and directed to change, or add to, the specifications for ingredients and the amounts thereof required to conform to the Federal definition of enriched bread when promulgated or as from time to time amended.

Section 4.

(a) The enrichment of bread may be accomplished through the use of enriched flour, enriched yeast, other enriched ingredients, synthetic vitamins, harmless iron salts or by any combination of harmless methods which will produce enriched bread which meets the requirements of Section 3.

(b) Iron shall be added only in forms that are assimilable and harmless and which do not impair the enriched bread.

Section 5. It shall be unlawful to sell or offer for sale in this State any enriched flour or enriched bread which fails to conform to the labeling of the State Food, Drug and Cosmetic Law (Act 142, 1936) and of the Federal Food, Drug and Cosmetic Act, and the regulations promulgated thereunder by the appropriate federal or state agency, with respect to flour or bread introduced into interstate commerce.

Section 6.

(a) The State Board of Health is authorized as the administrative agency and is hereby directed:

(1) To make, amend and rescind such rules and regulations as may be necessary to carry out the provisions of this Act, including, but without being limited to, such orders, rules, and regulations as it is hereinafter specifically authorized and directed to make.

(2) From time to time to adopt such regulations changing or adding to the required ingredients for flour or bread specified in Sections 2 and 3 as shall be necessary to conform to the definitions and standards of identity of enriched flour and enriched bread from time to time promulgated by the appropriate federal agency pursuant to the Federal Food, Drug and Cosmetic Act,

(b) In the event of the finding by the State Board of Health that there is an existing shortage or imminent shortage of any ingredient required by section 2 and 3 of this Act, with the result that the sale and distribution of flour or bread may be substantially impeded by the enforcement of this Act, the State Board of Health shall issue an order, to be effective immediately upon issuance, permitting the omission of such ingredients from flour and bread. Whenever the State Board of Health finds that such shortage no longer exists, it shall issue an order, to be effective not less than ten (10) days after publication thereof, revoking such order. Any such findings as to the existence or imminence of any such shortage, or the cessation thereof, may be made by the State Board of Health without any hearing, on the basis of an order of, or factual information supplied by the appropriate federal agency (as hereinabove defined) or the War Production Board or any similar federal agency. In the absence of any such order or factual information the State Board of Health, upon receiving the sworn statement of any persons subject to this Act that such a shortage exists or is imminent or has ceased, shall, within ten (10) days thereafter, hold a public hearing with respect thereto, at which time any interested person may present evidence in support of such sworn statement, and any such finding by the State Board of Health may be based upon the evidence so presented. The State Board of Health shall publish notice of any such hearing at least ten (10) days prior thereto.

(c) All orders, rules, and regulations adopted by the State Board of Health pursuant to this Act shall be published in the manner hereinafter prescribed and, within the limits specified by this Act, shall become effective upon such date as the State Board of Health shall fix.

(d) Whenever under this Act publication of any notice, order, rule or regulation is required, such publication shall be made at least three (3) times in ten (10) days in newspapers of general circulation in three (3) different sections of the state.

(e) The President is authorized to collect samples for analysis and to conduct examinations and investigations for the purposes of this Act, through any officers or employees under his supervision; and all such officers and employees shall have authority to enter to inspect any factory, mill, warehouse, shop, or establish-

ment where flour or bread is manufactured, processed, packed, sold, or held, or any vehicle and any flour or bread therein and all pertinent equipment, materials, containers and labeling.

Section 7. Any person who violates any of the provisions of this Act, or the orders, rules or regulations promulgated by the State Board of Health under authority thereof, shall, upon conviction thereof, be subject to fine for each and every offense, in a sum not exceeding \$100.00, or to imprisonment for not more than 30 days, or both such fine and imprisonment.

Section 8. All Acts and parts of Acts inconsistent with the provisions of this Act are hereby repealed to the extent of such inconsistency.

Section 9. If any provisions of this Act or the application thereof to any persons or circumstances is held invalid, such invalidity shall not affect other provisions or applications of this Act which can be given effect without the invalid provision or application, and to this end the provisions of this Act are declared to be severable.

Section 10. Active enforcement of this Act shall be deferred until October 1, 1942.

Approved by the Governor July 11, 1942.

A true copy:

JAS. A. GREMILLION,

Secretary of State.

Regulations Promulgated Under Authority of Act 202 of 1942—The Louisiana Enriched Flour and Bread Law

Regulation 1.00—All enriched flour shall be labeled as "Enriched Flour."

1.01—The addition of enriching ingredients to flour other than those required by Act 202 of 1942 shall be limited to: (a) Vitamin D, not less than 250 U.S.P. units nor more than 1,000 U.S.P. units per pound; (b) Calcium (Ca), not less than 500 milligrams nor more than 2,000 milligrams per pound, except that enriched flour may be acidified with mono calcium phosphate irrespective of the minimum limit for calcium (Ca) herein prescribed; (c) Wheat germ or partly defatted wheat germ, not more than 5% by weight. When any such ingredient is added the kind and amount shall be plainly stated on the label.

1.02—When any reference is made on the labeling of flour to the kinds and amounts of enriching ingredients which have been added, such reference shall be limited to show the proportion of the average adult's daily requirements of such substances.

1.03—Enriched flour labels shall not contain claims regarding physiological or therapeutic effects of enriching ingredients nor information concerning other minerals or vitamins; except, that self-rising flour or phosphated flour shall list the kinds and amounts of added chemicals as required by Act 181 of 1936 (Self-Rising Flour Law.)

Regulation 2.00—Bakers or other commercial secondary processors purchasing unenriched flour shall furnish the seller with a certificate of intent, certifying that the unenriched flour will be used only in the production of flour or bread enriched within the purchaser's establishment in compliance with the law and these regulations. The certificate shall show, in addition to any other information contained therein, the name and address of the purchaser, the name and address of the seller, effective date, and the purchase or purchases covered by the certificate.

2.01—The certificate shall be made in triplicate. The seller shall be given one copy, one copy shall be forwarded to the State Board of Health and one shall be retained by the purchaser.

2.02—The certificate shall be in one of two forms:

(a) A continuing certificate covering all purchases from each seller for an indefinite period of time and specifying that the certificate shall remain in force until notice is given in writing of its cancellation.

(b) A certificate covering a single purchase order, in which case the certificate shall specify the exact quantity of flour covered by the certificate, the trade or brand names, or other identifying marks on the flour containers, and any other information needed to identify the flour as that covered by the certificate.

Regulation 3.00—All enriched bread, when wrapped, shall be labeled "Enriched Bread."

3.01—The addition of enriching ingredients to bread, other than those required by Act 202 of 1942, shall be limited to: (a) Vitamin D, not less than 160 U.S.P. units nor more than 640 U.S.P. units per pound; (b) Calcium (Ca), not less than 333 milligrams nor more than 1,333 milligrams per pound, except that enriched bread may be acidified with mono calcium phosphate irrespective of the minimum limit for Calcium (Ca) herein prescribed; (c) Wheat germ or partly defatted wheat germ, but in no case shall the total quantity thereof be more than the quantity which may be present as a result of the use of enriched flour. When any such ingredient is added the kind and amount shall be plainly stated on the label.

3.02—When any reference is made on the labeling of bread to the kinds and amounts of enriching ingredients which have been added, such reference shall be limited to show the proportion of the average adult's daily requirements of such substances.

3.03—Enriched bread labels shall not contain claims regarding physiological or therapeutic effects of enriching ingredients nor information concerning other minerals or Vitamins.

Regulation 4.00—Any flour mill, flour warehouse, wholesale flour dealer's establishment, or any other place where flour may be milled, stored, distributed or offered for sale, or any bakery, bakery warehouse or secondary flour processing establishment in Louisiana shall be subject to inspection by an authorized representative of the State Board of Health at any reasonable time during working hours to determine whether flour or bread stocks are in compliance with the law or these regulations.

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